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THE DENTAL TIMES.

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CAOUTCHOUC.

ITS HISTORY, PROPERTIES; ITS COMBINATIONS FORMING HARD RUBBER, AND THE MANNER OF WORKING IT FOR DENTAL PURPOSES.

BY E. WILDMAN, M. D., D. D. S.

CONTINUED FROM PAGE 169, VOL. II.

Hard rubber is used by dentists as a base upon which to mount artificial teeth; to attach teeth and blocks to a gold base; to lengthen teeth on a gold base, or refit after absorption has taken place, and to restore the loss of the palate. It has been called into requisition to repair the loss of the nose, and for this purpose, owing to its plasticity, strength and durability, it fulfills most of the required indications better than any substance heretofore used. It may be also used for instrument handles and impression cups, &c.

In treating upon working rubber for dental purposes, I shall not give in detail the various modes practiced by different manipulators, as this would fill a volume, but confine myself principally to my own. For vulcanite work, in obtaining an impression of the mouth, the same course should be pursued as for metal work, taking care to have it accurate and smooth, free from imperfections; and I would here call attention to an important step in taking an impression of the mouth, which I find is overlooked by many, that is, immediately before inserting the cup into the mouth, with a napkin wipe the gums (and teeth if there be any) dry. This I look upon as being an essential point in procuring an accurate impression, especially when wax or wax compounds are used. The saliva, when present on the gums, interposes a viscid film between the wax and the surface which we desire to obtain an impression, causing the wax to glide over the surface instead of adhering, thereby destroying the accuracy of the impression. For partial sets, I prefer the wax compound of paraffin and wax, and give it the preference to wax or any other of the compounds of wax that I have used, or even plaster; but without the precaution of having it just soft enough to be plastic, and the gums and teeth perfectly dry, it would not be reliable. In cases where there are no teeth, I invariably use plaster to take an impression. Where the gum and palatine arch are of uniform consistency, use plaster alone, but where some parts are yielding and others rigid, first take an impression in wax or wax compounds of a consistency to press up the yielding parts, as they would be affected in mastication, then remove, trim and score the wax impression, add a film of plaster, re-insert in the mouth, press firmly up and get a plaster impression, which will be reliable.

In making the model, care should be taken to have its face smooth, and the body hard and compact. To insure a smooth surface with a plaster impression, the plaster should be saturated with water; the better plan is to cast the model immediately after taking the impression; if this is not practicable, immerse in water to restore what is lost by evaporation. Then use such substance as the operator may prefer to prevent adhesion; the practice of drying the impression, varnishing and then oiling, is a useless waste of time; a thin film of oil may be used, but I prefer a solution of soap, neither of which must be used in excess, and a solution of soap can only be used upon naked plaster; if applied to varnished plaster or a wax surface, it will act upon the plaster cast into the mould, and cause its surface to be pulverent, so that the fine lines will be readily effaced. The same effect upon the surface of the model may be produced where the impression is dry, by its absorbing the water from the cast, so as to prevent the proper chemical union taking place. To obtain solidity, the plaster should be of good quality, mixed as thick as can be manipulated, and free from air bubbles.

When the impression has been taken with wax, where there are teeth, fill the cavities made by the teeth with water, then add a little plaster, mixed thick; jar the impression; the plaster will settle into the recess and the water will rise; then add sufficient plaster to make the model of the required thickness, jarring so as to cause the plaster to better consolidate.

In parting the model from the wax impression, I prefer immersing the whole in water at a temperature just sufficient to make the wax plastic enough to be removed from the teeth without endangering their fracture. The advantage of warm water over dry heat is, that it keeps the plaster saturated, and the wax or wax compound does not enter its pores, parts freely, and leaves the surface clean, which is very important for vulcanite work. When parted in this manner it is not necessary to oil the wax impression before casting into it.

For the base for the model set, various substances are used. Some prefer wax in sheets; these may be made by casting or rolling wax to the proper thickness, or a better plan by immersing sheets of paper in melted wax, withdrawing to cool, and repeating the process until the sheet has obtained the required thickness. The gutta percha of commerce has been used, but is objectionable for the reason, when in thin sheets it is wanting in the proper rigidity, and often becomes so adhesive as to make it unpleasant and difficult to work. Others prefer a metal plate stamped up as for a metal base; when such is used, block-tin or pewter may be resorted to with advantage.

I prefer as a base, the prepared gutta percha; this is prepared by incorporating with gutta percha white oxide of zinc, and a fine white clay to give it firmness, also a little vermillion is added to give it a better color. Various compounds are vended, some are wanting in the necessary rigidity, others after a short time become so brittle as to be worthless. At present I have found that manufactured by Am. H. R. Co. the most reliable.

In making a model plate of this substance, the prepared gutta percha may be softened by dry heat, or preferable in water at a temperature above 150° F. The model should be saturated with cold water, this prevents the gutta percha from adhering and injuring the face of the model; the softened gutta percha is then pressed down firmly with the fingers, wet with cold water.

In arranging blocks or gum teeth, the approximal faces should be fitted accurately, and, when practicable, with a very thin wheel, cut grooves in the base and approximal faces; the rubber flowing into these grooves materially assists the pins in retaining the teeth in their position, and in many cases I rely as much upon the grooves as upon the pins.

Where teeth are used with plain pins, the pins should be curved or hooked horizontally; if the curve is made perpendicularly, and in an arc of a circle, of which the base of the tooth is the centre, the pins will easily pull out by a force applied to the point of the tooth. Double-headed pins are the most reliable, and when properly made, there is no possibility of the tooth becoming detached from the rubber without a fracture of the pin or tooth.

In some peculiar cases where I could not procure rubber teeth to answer the purpose, I have used the ordinary plate teeth. They may be prepared so as to make them as firm and secure as rubber teeth, by running a film of gold solder upon a narrow strip of gold or platina plate; then square the ends of the pins, bind or clamp the strip with the solder face in contact with the ends of the pins, heat up to the fusing point of the solder, this will unite the strip to the pins and form a staple, giving a firm hold for the rubber, and where there is a narrow neck of rubber running out to a single tooth, this strip may be extended down into the rubber to give it additional strength; in such case the metal should be serrated at the edges, or have small holes drilled in it.

In upper sets, where there are only a few of the under front teeth, and they are irregular as to position or height, we may form an articulatio with the rubber, just back of the point of the artificial teeth. This is done when the teeth are arranged upon the model plate, by placing soft wax on the back of the teeth, and allowing the patient to bring the jaws together sufficient to form the desired articulation. We thereby secure an impression of the antagonizing surface of the under teeth, which must be carefully preserved in the model, and also in finishing the rubber set; this will, in many cases, prove of great advantage, giving a bearing for all of the natural teeth, which could not be obtained without making the artificial irregular and unsightly.

Again, there are many cases where some one or more of the inferior molars, when the front teeth are properly articulated, project up so far as not to admit of the use of a porcelain tooth having sufficient substance to bear the force in mastication; in such cases rubber may be substituted with good effect. The proper length and form of antagonizing face may be obtained with wax, on the same principle as mentioned in the preceding case. In finishing the model, it should be smooth and rather thicker than we desire the plate when finished; just sufficient additional thickness given to allow for trimming and polishing; a large excess is a loss of material and time.

The next step, after the model has been made and the articulation proved to be correct, is to place it in a flask. The keys or guiding pins of a flask should be long, and fit accurately, so as not to allow any lateral motion when the sections are closed.

Before casting into an iron flask, it should receive a coating of some substance to prevent the plaster from adhering to it; for this purpose, I generally use a solution of soap, allowing the film to dry; this causes the plaster to part more readily from the iron. I have a rule in the treatment of my flasks which I think a good one, that is, when a flask is opened, I immediately remove all the plaster, wash it clean, and then dry; by this means flasks that have been in use for years are as clean and free from oxide as when new. When first opened, it cleans much more easily than when the plaster has been allowed to become dry and cemented to the iron by oxide; besides economy in time, we have a sightly instrument the next time its use is called for.

In filling a flask, first saturate the model with water to prevent it from robbing the new plaster of its moisture; mix the plaster thick as it will pour, to give it strength, partially fill the lower section, then introduce the model not horizontally, but inclined at one edge, so as it is forced down into its bed the air shall be excluded from beneath it. The proper height to fill the lower section, or to have the line of division, is, for teeth whose bases rest upon the base plate just below the porcelain so as to allow the teeth to be imbedded in the upper section; for teeth whose bases rest upon the natural gum, the division should be at the point, fastening them in the lower section. After the plaster has set, trim the surface smooth, to prevent adhesion of the upper section, some varnish and oil, others simply oil; either will answer the purpose, but I prefer a thin coating of a solution of soap; this done, the upper section is then carefully filled.

To separate the flask, dry or moist heat may be used. Dry heat is more uncertain than moist, for the reason the heat expels the moisture from the plaster, and if carried too high, the wax melts and runs into the plaster, or if gutta percha is used, it becomes adherent, and is very difficult to remove. When this difficulty occurs with wax, it may be partially overcome by melting it out over the fire, or better immersing the flask in boiling water with the face of the mould upwards; but in either case, the face of the plaster is liable to be contaminated with wax.

I prefer the use of moist heat, and proceed in this manner: in a basin of water, beside my flask I place a thermometer, gradually raise the heat to 125° F., not higher, allow the flask to remain in the water at this temperature a few minutes, so this degree of heat may penetrate through its substance; then remove and separate; when these conditions are followed, the model plate parts readily from the plaster and teeth. Should it accidentally get too warm, and there is wax present, immerse in cold water to chill the wax; it will then freely part from the surface of the plaster as it is saturated with water. The mould should be thoroughly cleaned, and every particle of foreign substance removed from the pins. I find a small pointed instrument, flat, and curved at the point nearly at a right angle with the shaft, very useful in cleaning under the pins. It is advisable to rub the pins with a small pledget of cotton dipped in absolute alcohol, especially where there are any particles of foreign substance adhering to them.

The importance of removing every particle of wax from the mould is demonstrated by some experiments I made to ascertain the effect of lard oil, yellow wax, white wax and paraffin upon rubber during vulcanization. In the bulbs of separate tubes were placed these substances in contact with unvulcanized red rubber; they were corked, and then put in a bath of paraffin, in which was suspended a thermometer; paraffin, when melted, is transparent, so the effect at the different stages could be readily noted. The heat was gradually raised, and the result was as follows:

Paraffin and Rubber.—At 220°, no apparent action;
At 280°, deep red;
At 300°, similar to 280°, little apparent change.

After being at 320° one and a quarter hours, and at 320°, appeared nearly all solid in the tube; a slight portion of a yellow oily-looking fluid ran down when the tube was inverted.

When cold, the paraffin and rubber in a great measure separated; but the integrity of the rubber was lost where it had been in contact with the paraffin.

Lard Oil and Rubber.—At 220°, rubber commenced to dissolve;
At 280°, oil red, dissolved more than the paraffin;
At 300°, action slightly increased;
At 310°, rubber run down, but not all dissolved.

After being at 320° one and a quarter hours, rubber nearly all dissolved.

When cold, oil red, fluid, no solid rubber in the tube.

Yellow Wax and Rubber.—At 220°, no action;
At 280°, action very slight;
At 300°, action slightly increased.

After being at 320° one and a quarter hours, and at 320°, fluid deeply colored.

When cold, the dissolved remained in combination; integrity of the rubber destroyed.

White Wax and Rubber.—At 220°, no action;
At 280°, wax slightly tinged with red;
At 300°, quite red.

After being at 320° one and a quarter hours, and at 320°, wax fluid and deeply colored.

When cold, wax and rubber remained in combination.

White wax appeared to act more upon the rubber in the early stage than the yellow, and its solution was more homogeneous at the termination of the experiment. Whatever arguments that may be urged in favor of slovenliness in manipulation, are fully answered by the above results.

Grooves or gates should be cut in the plaster, radiating from the mould to the outer edge of the flask, to allow the excess of rubber to flow out when the sections of the flask are being brought together. Some cut a groove encircling the mould about midway between it and the edge of the flask, then making numerous small grooves radiating from the mould to the encircling groove, and from this a few larger ones to the circumference of the flask. This having been done, the mould is carefully brushed, to remove all loose particles of plaster. The model should then be coated with some substance, to prevent the rubber from penetrating and adhering to its surface. Various substances, with varied success, have been used for this purpose. Finely pulverized *soap-stone* rubbed into the face of the model with the finger, has been used with a moderate degree of success.

Tin Foil is extensively used; by giving the surface of the model a coating of varnish, then, while it is adhesive, press down upon it a sheet of tin foil, it fulfills the required indications. When the tin foil adheres to the rubber, it may be removed after the case is taken from the flask, by the application of either nitric or hydrochloric acids.

Soluble Glass, or Liquid Silex, prevents the adhesion of the rubber, but it must be used with care. Give the face of the model a thin, uniform coating, and allow it to dry before the packing is commenced. This precaution is necessary to insure success; for if the liquid silex is in excess and fluid, it will insinuate itself between the pieces of rubber in packing, and prevent their adhesion. I have just commenced to use this substance, and so far have met with perfect success.

A preparation called *Ethereal Solution,* offered in the market, is very highly extolled by those who have used it, and I have no doubt it performs all that is claimed for it.

Collodion answers the purpose well, and I have used it successfully for several years; the only objection to it is, the film will sometimes adhere to the rubber when vulcanized, and so darken it as to give it an unsightly appearance.

To those who desire to prepare the cotton and make the solution, the following formula I have found, after numerous trials, the most reliable. To prepare the cotton, take

Pure nitrate of potash, finely pulverized and dry,	600 grs.,
Add water,	1½ f. drs.,
Sulphuric acid, (commercial,)	12 f. drs.

Stir well together with a glass rod; when at the temperature of 130° F., immerse the cotton, and allow it to remain from seven to ten minutes; then press out the acid, and wash quickly in a large quantity of water, repeat the washing until all the acid is removed; then press the pyroxyline or changed cotton, in the folds of a napkin, to absorb the water, separate the cotton into a loose mass, and dry at a moderate heat.

Cotton thus prepared is somewhat explosive, although not so much so as true gun-cotton, leaves a residue, and is more soluble.

To make the solution, take

Rectified sulphuric ether,	12 drs.,
Absolute alcohol,	4 drs.,
Prepared cotton, (pyroxyline,)	5 grs.

The addition of alcohol to the ether alters the properties of the film from what it would be if the ether was used alone; it possesses little consistency, adheres firmly, and has less tendency to contract. Where a collodion of greater consistency is required, add more pyroxyline to the solvent, and, where the taste of the operator requires it, add a little alkanet root to the ether before the pyroxyline is introduced, and any shade may be obtained, according to the quantity of alkanet used, from a faint blush to a deep red.

To fill the joints between the blocks or gum teeth, different substances have their advocates, viz:—calcined plaster, finely pulverized silex or felspar moistened with liquid silex, calcined plaster colored with vermillion, liquid silex, and os-artificial, all of these in the course of time will yield to the action of the fluids of the mouth, and then the ill-fitting joints will be a receptacle for soft particles of food, which will be more objectionable than having them filled with good solid rubber. The best filling is an accurately fitted joint, when so made; when the enveloping plaster is of good quality and properly mixed, and no undue force is used in bringing the sections of the flask together, there is little danger of the rubber insinuating itself into the joints.

The next step is to pack the rubber in the flasks. Sometimes in opening the flask or cleaning out the model base, a block or oftener a tooth becomes loosened from its bed; when such accidents occur, the best mode of remedying it that I have found, is to place a drop of very thick shellac varnish upon the plaster, then force the block or tooth into its position; in a short time the plaster will absorb the alcohol from the shellac, and it will be firmly held in its bed.

The flasks or moulds may be packed cold, but it is a better plan to warm them; the heat should be raised gradually up to the point rubber is softened. One important consideration should ever be borne in mind to insure success in the manipulation of rubber, that is, the moulds, instruments used, and rubber, must be perfectly clean and free from all foreign substances; cut the rubber in small strips and squares, and heat it to make it more plastic. The heating may be done over the naked flame of a lamp, or upon a metal plate; by either of these modes the rubber is liable to become overheated and its texture impaired. The better plan is to use a metal water-box, a suitable size is one having a surface six by eight inches, two deep, with a tube in one of the corners, one inch in diameter and two in height; this answers the double purpose of an opening to fill the box and to allow the escape of steam. In using this instrument, there is no danger of overheating the rubber. With the strips, pack around the pins and into the grooves, then proceed with the squares, using care to consolidate the pieces as added, and not to enclose any air bubbles. Avoid packing full to the porcelain gums, especially when they are thin and come near the model, as in such case the force in bringing the flask together would be, in a great measure, expended latterly against the porcelain shell and endanger its fracture. By making the centre the fullest, the force is expended upon the strongest part of the mould, and as it yields, the rubber flows in around the more delicate parts.

Several rules have been given to ascertain the exact quantity of rubber required to fill the mould. The specific gravity of pure wax is 0.96. I have found that of the American Hard Rubber Co.'s prepared gutta percha to be 2.454, and the American Hard Rubber Co.'s red rubber 1.572; hence to fill the mould, when pure wax is used for a model plate, it will require to one part of wax, by weight, 1.6 of the Co.'s red rubber, and when the plate is made of prepared gutta percha, it will require to one part of it, by weight, .6 of the red rubber. When the wax is colored, the disparity in weight will not be so great as with pure wax.

In filling the mould, an excess of rubber should be used to insure compactness. It is a much better plan to lose a little rubber than a set of teeth, which is liable to occur where too close a calculation is made to save a few scraps of rubber.

Bringing Sections of the Flask together.—Although rubber is plastic, yet such is its nature that it will not yield to the sudden application of force, as well as to continued firm pressure; therefore the best plan is to apply the force through the medium of a spring clamp, which acts uniformly and continuously, which is less liable to fracture the porcelain gum than when it is abruptly applied.

Several different spring clamps have been devised, which operate well. A modification of my own construction I prefer; it has a strong steel spring of a ⊂ shape, to its lower limb is secured a cast-iron plate, sufficiently large for the bottom of the flask to stand upon; to its upper limb is also secured a plate, through which three thumb-screws pass and press upon the top of the flask at equi-distant points. The advantage of having three screws arranged in this manner is, that it enables us to bring the sections of the flask together parallel.

In closing the flasks, they should be heated to make the rubber more yielding and adhesive. Dry or moist heat may be used. In using dry heat, there is danger of overheating the rubber, and thereby injuring its texture. I give a decided preference to moist heat, or retaining the flask in boiling water, (frequently gently tightening the screws,) until it is closed. It has the advantage over the dry process in the saving of time, and of not endangering the integrity of the rubber.

Care should be exercised to bring the sections close together. If this precaution is neglected in partial sets, where the base of the teeth do not rest upon the gums, they will be displaced from their relative position towards the natural teeth. If the teeth rest upon the gums, and the division line is at the points, there will be a sheet of rubber overlapping them, which will be troublesome to remove, and in a whole set there will be an extra thickness under the teeth, making them too long. When the flask is closed, it should remain under pressure until the work is vulcanized and cool.

Vulcanization.—To vulcanize rubber, requires a high degree of heat, and this to be maintained for a time proportioned to the temperature; as a medium, hot air, hot water, or steam may be used. Fusible metal, wax, paraffin and other substances, capable of sustaining the required degree of heat without change, have been resorted to. Either water or steam is used by dentists in a steam-tight vessel, called a vulcanizer. Vulcanizers with a single chamber, which are but a modification of Papin's digestor, are now universally used. When the operator desires to vulcanize in steam, using a vulcanizer with a single chamber, it can be readily done by placing a diaphragm above the water, and let the flask repose upon it. Every vulcanizer should have a safety valve, or its equivalent; also, a *correct* thermometer or a steam gauge, to enable the operator at all times to know the extent of pressure within.

A vulcanizer should be strong enough to resist far greater pressure than is usually employed, for the reason that it is continually growing weaker every time it is used, from the strain upon the fibres of the metal, and erosion of its substance; this latter cause of loss of strength has been disputed, but I have repeatedly detected copper in the dark deposit which forms upon the inside of the vulcanizer; this proves a loss of metal, consequently strength; and also, to avoid the danger of an explosion in case by inadvertence, the pressure should become unduly great.

Wrought is preferable to brittle cast metal for a vulcanizer, as it has greater tensile strength, and in case of an explosion, it generally opens in a rent, while cast metal separates in fragments, which would be rather unpleasant companions when propelled by a force of ninety and upwards pounds to the square inch.

Very many accidents have occurred by the use of badly constructed vulcanizers, and from the want of the knowledge of the strength of metal and the force of steam by dentists; and we may reasonably look for their increase in the use of the vulcanizers in market after they require age, if more discretion is not used by dentists.

The importance of this knowledge, I have endeavored to impress upon the minds of the students of the Pennsylvania College of Dental Surgery for years past, and I am gratified to see the interest taken upon this subject, as is evinced by the attention paid to the valuable articles in the DENTAL TIMES, written by Dr. A Lawrence.

Numerous experiments have been made by scientific men to ascertain the elastic force of steam at different temperatures. The results of their investigations are not uniform, although all show the immense force of this agent at high temperatures. Haswell's tables are looked upon as good authority: the results of the investigation of the Franklin Institute committee in the higher degrees give a greater elastic force. I shall, however, quote the results of the experiments of the commission of the French Academy, appointed by the French Government to investigate this subject, for the reason that, from the manner in which they were conducted, they are probably as reliable as any, and that they are extended to a more elevated temperature than the others.

Elasticity of steam, taking atmospheric pressure as a unity.	Temperature, F.	Pressure per square inch, lbs.
1	212°	14.7
1½	233.96°	22.05
2	250.52°	29.4
2½	263.84°	36.75
3	275.18°	44.1
3½	285.08°	51.45
4	293.72°	58.8
4½	300.28°	66.15
5	307.05°	73.5
5½	314.24°	80.85
6	320.36°	88.2
6½	326.26°	95.55
7	331.70°	102.9
7½	336.86°	110.85
8	341.78°	117.6
9	350.78°	132.3
10	358.88°	147
11	366.85°	161.7
12	374.00°	176.4
13	380.66°	191.1
14	386.94°	205.8
15	392.86°	220.5
16	398.48°	235.2
17	403.82°	249.9
18	408.92°	264.6
19	413.78°	279.3
20	418.46°	294

I now wish to call the attention of those using high steam to an important consideration. In raising steam, the ratio of the increase of pressure or elastic force is far greater than that of the increase of temperature. By referring to the above table, commencing at 212°, and taking steps as near fifty degrees as is given in the ascending scale, we find this exemplified. Thus

	Increase of temperature.	Increase of force per square inch.	Giving a force per square inch.
From 212° to 263.84°	51.84°	22.05 lbs.	36.75 lbs.
" 363.84° to 314.24°	50.40°	44.10 lbs.	80.85 lbs.
" 314.24° to 366.85°	52.61°	80.85 lbs.	161.85 lbs.
" 366.85° to 418.46°	51.61°	132.15 lbs.	294 lbs.

This comparison shows clearly how rapidly the pressure increases at high temperatures, and warns the operator that a strong instrument, combined with care and judgment in its treatment, are indispensable to safety. Besides the rapid increase of pressure, it must be borne in mind that at high temperatures copper becomes weakened, and in a measure loses its power to resist this great imprisoned force. Copper, in passing from 212° to 320°, F., loses about one-tenth of its strength, and at 550°, it has lost one-fourth of its tenacity.

[TO BE CONTINUED.]

DISEASES OF THE MAXILLARY SINUS.

BY GEO. T. BARKER, D. D. S.

[Continued from p. 147.]

The nature, causes and treatment of dropsy of the antrum having been considered in previous communications, I now propose to direct attention to another abnormal condition, which is known as inflammation of the lining membrane of the maxillary sinus. Dropsy of the antrum is always attended with active or passive congestion, and thus it is that it may continue until eventually true inflammation has been induced. The lining membrane of the maxillary sinus may become inflamed from a variety of causes, among these may be instanced as the most frequent, external injuries, blows on the side of the face, suppression of normal secretions—as the cutaneous perspiration which may be surpressed by cold acting for a length of time upon the face—the accumulation of degenerated mucus in the sinus, which by its presence irritates the lining membrane, exciting inflammation, as previously stated, a depraved condition of the blood, arising from a syphilitic taint, or a scrofulous diathesis, and above all the irritation developed by loose, carious or necrosed teeth or roots, or any of those disordered conditions of the periosteum, which terminate in either periotitis or alveolar abscess; the inflammation in such cases being induced by contiguity of structure—it may also be propagated in this way from the mucous membrane of the nose. As has been stated, persons of scrofulous or syphilitic habit are more prone to affections of this nature in consequence of the depraved conditions of the blood. In both of these disorders, nutrition is imperfectly performed, the perfect balance which is necessary to exist between "*waste and supply*" to induce health is not kept up, the balance being in favor of the former; hence it is that inflammations of lining membranes of cavities, as the nose, frontal, or maxillary sinuses are not uncommon. But of all the different influences which induce the abnormal condition under consideration, all writers agree that diseased teeth and roots are the most frequent exciting cause; therefore it must be evident that dentists should be familiar with these disorders, and be prepared to treat them intelligently and creditably to themselves and their profession.

The symptoms of inflammation of the sinus and mucous engorgement differ somewhat from each other; in the last named condition there is usually an entire absence of pain until the chamber of Highmore has become filled; the pressure of the enclosed fluid upon the nerves of the lining membrane being the cause of the pain. In inflammation, however, there is usually more or less pain from the beginning, dull and continuous, gradually becoming more and more severe, a sense of weight and heat; the pain in some cases seeming to fix itself in the roots of the molar teeth. It has been contended by some writers that where the inflammation of the sinus has been induced by diseased teeth, that tooth-ache of a severe character is generally induced. This might be the case in certain conditions, as in periostitis or acute alveolar abscess, but would not necessarily follow from necrosis or passive alveolar abscess. In some cases there is usually fever, the pain occupying the whole side of the face, extending to the orbit, the nose and the frontal sinuses. The fever may be of the *sthenic* or *asthenic* form, but is generally of the latter variety, particularly if the individual has a constitution broken by privation, dissipation, venereal or scrofulous taint, or long residence in a vitiated atmosphere. There is usually great tenderness of cheek on the affected side, and sometimes the integuments will pit on pressure. A thin, watery fluid, very fetid, in many instances escapes into the nostrils from the sinus through the antral opening; this fluid being the modified secretion of the cavity.

Dr. Gross, in speaking of this disorder, remarks:—"The symptoms which are always less marked in the chronic than in the acute form of the malady, are not diagnostic, and the practitioner should therefore always institute the most thorough examination before he finally decides on their value. It is of great importance that this disease should be early recognized and properly treated, as its tendency, when neglected or mismanaged, is to run into suppuration or other mischief."—(*Gross' System of Surgery, Vol.* 2.)

The first indication in the treatment of this disorder, is the immediate removal of diseased teeth and roots, and to ascertain that these are present will frequently require the closet scrutiny and investigation; and on two different occasions I have removed the exciting cause (a diseased root not visible with a glass) of inflammation after the patients had been ineffectually treated for a considerable length of time, the mouths having been repeatedly examined by the attending surgeons. So important is this examination considered, that some of the most prominent surgeons of this city direct, for all cases, a competent dentist to examine the mouth, and remove diseased teeth and roots, not being willing to trust their own judgment in the matter, and such should be the practice elsewhere, though unfortunately it is not universal.

General or local bleeding is also indicated, particularly if the symptoms are severe. Blood may either be taken from the arm, or by the application of leeches to the gums or cheek. The saline cathartics are exceedingly useful, and should be freely administered. If the inflammation has been induced by cold, the use of the diaphoretics, as Tartar Emetic or Dover's powders, would be indicated. Warm applications, as steam, or fomentations of hops, or the preparations of opium, are of value for the arrestation of pain; but I have found a plaster thickly spread with the extract of belladonna, (*Emplastrum Belladonnæ*, U. S.,) and applied upon the cheek, to give almost immediate relief; this is also useful in the pain arising from periosteal inflammation.

In the treatment of this disorder, general antiphlogistic means are called for, also observing closely that the general condition of the patient is as perfect as possible, as it cannot be expected that the inflammation will terminate by resolution if the system of the patient is weakened or the blood in a depraved condition. As an example of the importance of the above suggestion, I will revert to a case that came into my hands some months since. The patient was from St. Thomas, W. I., and stated to me that the physicians on the island had never seen a case of inflamed antrum, and he suffered for a long time, mentally as well as physically, and at last concluded to come to the United States for treatment. On the trip to this country he was very sea-sick, and when he presented himself for treatment, he was greatly debilitated, the inflammation of the sinus had passed on to the suppurative stage, and he was greatly discouraged. The loose and diseased teeth were first removed; he was placed upon the use of the tonic preparations of iron, a free opening was made into the antrum, a stimulant injection was given for that cavity, a detergent and stimulating wash for the mouth and gums; also, recommending him to live generously, go to public places of amusement, and not to avoid society as he had done. As his general health improved, the disorder became less troublesome, and finally I had the pleasure to see him quite restored to health after the lapse of about two months from the time of his first landing in this country.

[TO BE CONTINUED.]

FROM MY NOTE BOOK.

BY DR. H. SCOTT.

I have, from time to time, noted down a great number of cases of irregularity of the teeth, from which I select for THE TIMES, the two following:

Case 1st. Mrs. R., aged about 28, called at my office to have some teeth filled. Her lower teeth were in situe, except the left cuspid on the right side, which had never appeared; the first deciduous molar remained firm and healthy, with no indications that its wanted successor had ever been formed. All the teeth in the lower jaw were tolerably free from caries, and the gums were healthy. In the upper set, there was a wider departure from the normal state; the left cuspid was wanting, the bicuspids were reversed; the second appearing in front of the first, with its labial surface presented towards the tongue. The lateral incisor on this side was, in shape and size, about as large as a grain of rye, and stood out towards the lip. The central incisors were one-third larger than natural, and carious on their approximal edges. The right lateral incisor was healthy and in place; the deciduous cuspid remained firmly, with caries on its posterior edge. The bicuspids stood with their proper edges together, crosswise; that is, the posterior one presented towards the cheek, and the anterior one towards the tongue, their cusps being reversed correspondingly. This lady had but one dens sapientia, and that was on the right side above. There were no indications in her case that the rudimental pulps of the wanting teeth had ever existed, and she was not conscious that any of her milk teeth remained. This case presented about 15 years since. I afterwards saw similar deformity in other members of her family.

Case 2d. Master G. was brought to me for my advice in regard to his teeth generally. I found his mouth healthy, except incipient decay in some of the molars, and between the superior central incisors. But the chief matter which attracted my attention, was the position of his teeth; the deciduous set had all been cast off, and the second permanent molars were fully matured, but the arrangement of the permanent set was most comical. In the lower jaw and on the left side, the cuspid was the third from the incisors. The bicuspids, in their natural order, preceding it. The lateral incisor of the same side stood exactly in the rear of the central. On the right side, the second bicuspid was well fixed between the cheek and the first molar, which inclined towards the tongue, dividing the space between them about equally. The cuspid of this side stood obliquely forward, with its fang crossing at an acute angle that of the first bicuspid. In the upper arch, the arrangement was not less abnormal but different. The left side was right till we came forward to the incisors. The lateral of this side was conical in shape, and stood obliquely inwards; the right lateral, flat and thin, was situated edgewise, and seemed pinched between the central and bicuspid. The centrals were normal in size and symmetry. The cuspid of this side, perfect in form and size, held its position between the bicuspids.

The boy's teeth were as free from decay as is usually found at his age. He was of florid complexion and sanguine temperament, and enjoyed good health. I could not learn by inquiry that any of his deciduous teeth had been prematurely extracted, or that he had suffered much with toothache in his milk set. He said that his first teeth became loose, and that he had "pulled" most of them with a string. As far as I have had the facilities to observe, I have not discovered similar disarrangements in the teeth of any branch of the family to which he belonged. His age was about fifteen years.

LANCASTER, OHIO, February, 1865.

ACCIDENTALS.

BY A. B.

The following cases which came under my observation, I am inclined to report, as they may prove interesting to some of the younger members of the profession, and lead them to exercise greater care in operating.

Case first was of a little girl who received a slight wound in the cheek, just opposite the second superior molar, by the slipping of an instrument while having the tooth filled. A couple of hours after, while at play, she distended her cheek with air, and when she opened the mouth for the air to escape, the punctured cheek remained in its distended condition, much to the alarm of herself and parents. However, before the physician who had been summoned made his appearance, the swelling had subsided, and the case terminated. The swelling was no doubt caused by the air being forced through the wound and between the fascia of the cheek; it lasted nearly half an hour.

Case second, which occurred under similar circumstances, did not terminate so favorably. When the cheek was punctured, a few drops of blood escaped, which did not interfere with the progress of the operation, but when completed, and while the patient was rinsing the mouth, a bunch an inch in diameter appeared on the temple, and the cheek was swollen from the ear to the chin almost instantly. In this case, there was internal hemorrhage, consequently the swelling continued, while the color turned to a yellowish blue, and then black, disfiguring the patient for several days. Such a case might happen to any one, while a thousand such wounds might be made without such a result. Happening in the office of one whose reputation is established, little would be thought of it, but such a case in the hands of a young man, under some circumstances, might entirely ruin his practice.

PHILADELPHIA, June, 1865.

A RESUME OF METALS USED IN FILLING.

BY JAMES TRUMAN, D. D. S.

Is it possible that we shall, as a profession, ever reach a position when the necessity of a repetition of the same round of subjects, and of discussing modes of manipulation in operative dentistry, that have become so familiar to all of us, shall pass away and be left to the colleges for illustration? I hope so; but that happy realization has not been reached. I feel very sensibly, however, that an article devoted to re-casting points that have so frequently been illustrated, can have but little to attract the attention of the veteran in the service. As Dr. Tomes justly observes in the preface to his Dental Physiology, "that it was not written for the learned, but for those who have yet to learn;" so I may say for this resume, that it is written not for those who have scaled the heights, but for those in the valleys, who need the same help that we, in times past, have received from others. I am so frequently reminded that each year has its generation of growth in the profession, to travel the same worn path, to meet with the same difficulties, to share its similar aspirations, to rejoice in a higher grade of attainments, that I feel, however unpleasant the task may be, we are bound in duty to them to occasionally retrace our steps, to act the volunteer guide, and smooth, perhaps, many an otherwise rough passage. This, I presume, comprises the whole theory of teaching. However little we may be in the advance, that little we have no right to withhold from the struggling, faithful workman.

However interesting a review of the past manipulative history of gold foil would be, it is not my purpose at present to enter into it, but shall commence with that metal as we have it in its present condition of use. It is divided into common or non-adhesive foil, adhesive foil, crystal or sponge gold.

But a few years have elapsed since it was thought absolutely essential that all gold foil should present one quality, second only to its purity, that of extreme kid-like softness. To furnish this of even character, was found to be very difficult, if we may judge by the few who established a reputation in its manufacture, but unless this was accomplished, it was considered impossible to produce the best work.

Common foil depends for its success upon its adaptability to all portions of the cavity in which it is placed. This is true of all the materials used for filling, in a certain degree; but is absolutely required where each pellet is expected to retain its individuality, and mould itself to all the irregularities of surface presented. To the operator with non-adhesive foil, the form of using the gold was of first importance, for upon this depended very much the success of the operation. The days when "ropes" were the all-essential to success, when pellets were to remove all difficulties, when cylinders were to smooth the way for those who could not appreciate the merits of the former have passed away, and we are bordering, if we have not already reached, an era when each of these may at times be valuable, but in which neither are essential to success. That the non-adhesive form of gold foil, as long as that metal is used in the profession, will remain as an invaluable addition to our stock of material, and which upon certain conditions could not be dispensed with; and while I am very willing to acknowledge a large amount of good work performed by it in the past, I still entertain the belief that its days of extended usefulness belong to the history of the profession, rather than to the needs of the present.

There are three conditions that I consider the use of non-adhesive foil cannot well be dispensed with. They are:

1st. When the flow of saliva is excessive and cannot be controlled.

2d. When the shape of the cavity is such that it is difficult or impossible to reach all parts with the plugger.

3d. When a filling of adhesive foil should, by carelessness or otherwise, be found defective at any point.

To use adhesive foil under the first condition, I regard an impossible feat, and that such a state of things is found in the practice of all there can be no room for doubt, notwithstanding the assertions frequently made to the contrary. By the use of pellets or cylinders, we may secure a satisfactory filling, notwithstanding an occasional submerging by the secretions of the mouth. Although cases will occur, when what are technically known as submarine fillings are necessary as a last resort, in the large majority, a constant change of napkins, with a free use of the syringe, to exhaust the saliva, will insure a filling, if not entirely dry, sufficiently so to secure the preservation of the tooth.

To meet the difficulty pointed out under the second head, and one by no means of uncommon occurrence, we can use the common foil, or slightly adhesive, to very great advantage. It is not unusual to find fillings, otherwise very creditable, defective at such points. The clogging of adhesive foil is a troublesome feature to the beginner, and it is in such situations the greatest care will be required to prevent it.

To overcome the third condition, that fillings, otherwise good, are often found in at the close of an operation, is one very difficult to remedy. At no part of a filling is this oftener met with than at the cervical wall of approximal cavities. Oftentimes nothing but an entire removal of the filling will remedy it, but where it is readily approached, make a cavity in the filling to cover the defect, and fill with the common foil. The same mode of treating a deficiency of gold at any other point can be adopted.

ADHESIVE FOIL.

This cohesive property of gold, engendered by a high degree of heat, was well known to the gold beaters, and to many members of the profession, prior to its introduction, but it was considered a detriment to the foil, rather than an advantage, and great efforts were made to remove it. It was not until April, 1855, that Dr. Arthur called attention to it in an article published in the "Dental News Letter," of that date, but the dental public were not prepared to accept it, and, as usual with all innovations upon the established order of things, met with opposition and ridicule. This is not surprising when we recall the class of instruments that had been considered necessary in the use of common foil. The serrations of an instrument had always been rated of secondary importance, and few were prepared to meet the difficulties presented, and after a few trials abandoned its use. But this distinguished and original observer was not to be deterred from the prosecution of his investigations, and the result of his labors was given to the public two years subsequently, in 1857, in a monograph, in which the whole matter was thoroughly discussed. From that hour to this, the subject has been one of constant disputation, but every year lessens the number of the opposition; and it must be a source of satisfaction to Dr. Arthur, that in so short a time the principle should be acknowledged, and practiced almost exclusively by the large majority of those who have attained eminence in this specialty.

Adhesive foil does not require for its use any special form or preparation of the foil. Any of the ordinary shapes of pellets, ropes, or cylinders may be used under certain general fixed principles that admit of no variation.

1st. To so loosely arrange the lamina of foil that the serrations of the instrument will readily pass through them.

2d. That whatever shape the gold may be made to assume, it must not be left of sufficient length to be endangered by the moisture of the mouth.

It will be found of importance that the folds of the foil should be as slightly compressed as possible, but at the same time no loose ragged edges should be left, a great annoyance in packing. The plan generally adopted, and probably as efficient as any other, is to tear or cut a third or half of the sheet of foil, fold it with the edges turned in, in the form of a very loose rope. This is cut in lengths proportioned to the size of the cavity to be filled.

All precautions possible must be taken to prevent moisture reaching the gold, by the use of wedges, rubber bands, napkins, &c. As before stated, absolute dryness is a pre-requisite to success; hence the impropriety of attempting to fill with a rope of several inches in length. The liability to contact with moisture, is too great a risk to run, and far overbalances any loss of time encountered in picking up separate pellets.

The success of all our operations with this kind of foil is based upon its property of welding, or the cohesive attraction of the particles of the metal. It is therefore of first importance, as a preparatory measure, that we select certain points in the cavity to be filled to sink depressions or pits, technically called retaining points. These are to be made by drill or excavator, and so shaped as to be readily and compactly filled. The number and position of these pits must be determined by the judgment of the operator, always remembering to cut or drill in a line that will not encroach up the pulp cavity.

The majority of failures made, may be attributed to carelessness in attending to this important matter. With the foundation properly commenced, there need be no further trouble anticipated, always excepting the the danger from inroads of moisture. The base being properly prepared, we carry our pellet of gold on the point of the instrument to its place and secure it there, and pack the part first laid down before attempting to fold over another portion. This will effectually prevent clogging, and will insure perfection, as all parts of the filling are constantly in the view of the operator.

It would not be in keeping with the limits assigned to this article, to enter more fully into details of the whole manipulative process of filling with this foil, and fortunately its simplicity is such that but brief explanations are all that need be required. With an ordinary degree of intelligent and persistent practice, the minor difficulties can easily be overcome. That the art of filling is more readily acquired under this system than any that have preceded it, is proven by the very large number who rank amongst the best operators in the country, and who have attained their skill in a comparatively short period.

Having taken a general survey of the advantages of this kind of foil, we cannot do justice to the subject, without enumerating some of the difficulties and errors that are likely to occur in its use.

1st. A poorly serrated instrument is a prolific source of non-success. I prefer that the points of my instrument should be of good length, very sharp, well tempered and very smooth. Any neglect in these several particulars will cause, if not failure, a vast amount of annoyance. To insure against the possibility of this, the points of the instrument should be carefully examined by a magnifying glass, and any defects remedied. The serrations must be sufficiently separated to clear themselves freely. Their number must be regulated by the size of the cavity to be filled. The filling of a large one is greatly facilitated by the use of a broad plugger with a number of points. The bending of the points of a poorly tempered instrument is a frequent cause of trouble, and will be indicated by dragging the gold from its position. This is frequently occasioned by passing the gold through the flame of a spirit-lamp. It will destroy the temper of the best made instrument. To obviate this, I have used for some years a stand with a mica top, on which the pellets may be laid and annealed.

2d. Carelessness in packing the gold in such quantities that clogging and consequent inability to reach distant points of the cavity is the result, and failure to fill sufficiently beyond the edge or wall, and want of caution in adapting the foil to the edge, are prolific sources of trouble. But all these difficulties are readily overcome by care, and are not inherent defects in the foil.

If simplicity is an important feature to be aimed at in all of our operations, there can be no question as to the merits of this peculiar form of gold; and although its discussion has almost closed in the journals, a large number of practitioners will be found scattered everywhere who still regard its introduction as an innovation upon the established order of things, and of no advantage in any sense. To those who will not use the means offered them, there is no other course but to continue blundering over old modes, until "time makes ancient good uncouth," even to their visions.

The question, whether there is really a welding property in gold, has not been brought forward. The change produced in the particles of gold by the annealing process, as exhibited under the microscope, is sufficient evidence to my own mind, and would be conclusive, if we had no practical illustration, aside from its use with the serrated instrument. But we are not left to speculation. Take two portions of non-adhesive foil, place them together, and go carefully over the surface with the finger or any other flat surface. There will be no cohesion of the particles. Take the same pieces, and anneal them carefully, join them, and go through the same process; with what result? An adhesion so perfect, that not only will it be found impossible to separate the sheets, but equally impossible to indicate the boundaries of either. With this simple illustration, I leave adhesive foil for a few words on

CRYSTAL, OR SPONGE GOLD.

This has had its day of excessive laudation and violent opposition, but has finally settled into an important position in difficult operations. When moisture can be entirely excluded, it can be manipulated with far greater ease than any form of gold; but it will not tolerate the least amount of dampness; hence, in cases where it would be most valuable, its use is rendered doubtful. I allude to large cavities that require considerable periods of time for their completion. The same general rules that govern adhesive oil will apply to it, and with conditions favorable, the very best work can be made with both; but, as before remarked, there are cases when neither are admissible, and we must fall back to the old modes of cylinders and pellets, ignoring the adhesive property altogether.

True advancement, in my judgment, is founded in a wise eclecticism, which, while it values authority, cannot safely set aside anything that may not at proper times germinate much that may aid ourselves and patients. The metal next in order of use is

TIN.

This humble material has been persistently kept in the back ground, since the earlier periods of our professional history. A tin filling has been considered almost a synonym for contempt. It is satisfactory, however, to observe that with more attention to its valuable qualities, greater care is extended to improving the modes of manipulating it. Tin foil has been generally wretchedly made, and, until recently, there was not a foil in the market that could be denominated good.

The adhesive property of this metal is very slight, and I know of no means at this writing to materially increase it, although it has been a subject of repeated experiments. Heat has but trifling effect upon it. To produce the best results with this foil, more care is required than with that made from other metals. I am aware that this is contrary to the general opinion; but a large experience in its use has satisfied me of its correctness. Great care is required in preparing the foil for use not to get too great a width of strip. The narrower this can be managed, the better success will be attained. Tin will exhibit its highest adhesive qualities without folding; but, as it is sometimes inconvenient to use it in that form, I fold it simply upon itself loosely. It is then cut into proper lengths. Tin treated in this way can be moulded into any form as readily as adhesive or crystal gold, and the same general mode of procedure as applied to the latter will do for the former. Fillings of tin made with sharply serrated instruments are solid, and but little inferior to gold in their preservative quality. The temptation with this metal is to fill too rapidly. What is gained in speed is lost in solidity, and the ultimate result is degeneration, breaking down of the particles and general discoloration. I have no hesitation in asserting that tin foil, properly manipulated, would make good fillings for approximal cavities of front teeth, and thus save thousands that annually go to destruction for want of a cheaper material than gold. I am aware that in making this assertion, I am running in opposition to prejudices of long standing. Indeed, so much and so long has it been taught that nothing but gold should enter a front tooth, that it requires more than ordinary temerity to recommend to our poor patients any other material. I have long been satisfied that this was one of the many untenable notions that it would be well that we rid ourselves as speedily as possible. But an essential pre-requisite to placing a filling in that position must be an ability to make it solid.

Of the metals that justly rank next to tin, if it is not its superior, is what is commonly known as

WOOD'S METAL.

The time that I have had this material in use has been too limited to test it, as time alone can do; but, so far as my experience has demonstrated, it is one of the most valuable additions to our stock of materials for filling teeth, and should receive the careful attention of those who desire to use a plastic material with all the advantages and none of the evils of amalgam. If anything I could say would induce any one to adopt it in preference to using the latter, I should feel that much had been gained for the interest of a suffering public. I recommend this metal the more freely, because its use will not have the tendency possessed by all plastic materials, of depreciating the quality of operations with other metals. The manipulation of this metal requires great care, combined with patience and experience.

The defects of the metal, as far as my observation has extended, are two. 1st. The heat required in its use. 2d. The impossibility of working it in the presence of moisture.

The first difficulty seemed to me an insurmountable objection, until, by use, the degree required was so much reduced, that the minimum amount for the metal, as at present prepared, was reached. I have since found less and less difficulty in this respect. Still, it must be acknowledged that upon very sensitive teeth, and upon those with the pulp nearly exposed, its use is attended with considerable pain. Much less suffering is experienced by covering the floor of the cavity with several layers of tin foil; but I would not recommend its use when there remained but a thin covering of dentine over the pulp. Further experience is necessary before we can take such risks.

The second objection is not so easily surmounted. I do not think it possible to fill a large cavity in the lower jaw when the secretion of saliva is excessive, and cannot be controlled with any certainty of its proving a successful operation. In consequence of this, I have experienced much trouble in securing perfect fillings where the cavity of decay extended beyond the neck of the tooth. This has been overcome, to some extent, by the use of a plate of tin foil overlapping the gum, but it must be acknowledged to be a very troublesome feature in the metal.

The explicit directions of the manufacturer, Dr. Wood, are ample for its use. Cut it into small square pieces, heating the instrument no higher than necessary to soften, not melting the metal, and beginning at the edges, pack as carefully with these pellets as though they were gold or tin, and substantially in the same manner.

As I before remarked, I consider this a very valuable addition to our limited stock of material, and the inventor deserves more recognition, for the service he has rendered the profession by its introduction, than he has yet received, or from present indications likely to get.

AMALGAM.

It is not the intention of this article to take within its folds this material, neither will it hold it up to excessive execration. It has its uses, but they are limited in their extent, and should be persistently kept within these bounds. That amalgam has and will preserve teeth for years, is undoubtedly true; that it will discolor the tooth so filled, and render the mouth unpleasant to look upon, is equally true. That it can preserve teeth in *good* condition, I do not believe possible, except in the smallest number of cases. The shrinking of the metal and breaking away at the edges, is almost a necessary consequent upon its use. But I have long since ceased to regard any discussion upon this metal as very unprofitable labor. So long as disinclination to work forms a prominent trait in the constitution of all men, and the ambition to superior excellence the aim and desire of the few, so long will a plastic material of this character be used; and if it have no other merit, it may cover up, if I may be permitted an Irishism, a multitude of uncommitted sins.

TEMPERATURE AND PRESSURE IN VULCANIZING.

BY A. LAWRENCE.

Since the publication of my article on the use of the steam gauge in vulcanizing, the question has been raised, in some minds, whether I am not mistaken when I state that 320+ degrees of heat, produces 85 pounds pressure by the gauge; or, in other words, whether the table of temperatures and pressures then submitted is reliable. This query arises from the knowledge of those informed in such matters, that Haswell's tables are calculated from a vacuum, and that gauges for high pressures are so constructed as to require a force equal to one atmosphere before they begin to be operative; for instance, that at 212 degrees, when steam begins to form, the gauge is only ready to move, and is therefore to be reckoned 15 pounds light when used in connection with the tables.

Theoretically, this view is undoubtedly correct, but "facts are stubborn things," and do not practically and fully coincide in such view, as I have abundantly satisfied myself by actual experiment; the modus operandi being as follows:—my vulcanizer, one of the first Warren pattern, about the size of a straw bee-hive, was originally furnished with a thermometer, safety-valve and whistle, which last two appendages I soon dispensed with as useless, and "run the machine" for two or three years with the thermometer only, as is now the common practice. Wishing to avoid the inconvenience, trouble and expense of the thermometer from breaking, and ununiformity of graduation, I next, at the suggestion of my son, Dr. G. W. Lawrence, attached a steam gauge, still retaining the thermometer, which I had carefully adjusted and tested to make all sure, with the intention of discarding the latter so soon as by comparing the two instruments, while in operation, the proper pressure by the gauge could be ascertained. The vulcanizer being now supplied with both thermometer and gauge, was warmed up and proceedings watched; the result of which was, that at the lower temperatures the gauge *was* light, but at from 280 degrees onward the two instruments got reconciled to each other, and agreed very well, showing 85 pounds pressure by the gauge, at a temperature of 320 degrees, thus verifying so much of the published tables as are of any practical value to the dentist. I tried the experiment over again, using another gauge, with the same result.

Since my attention has been called to the matter again, I have experimented in the same direction, in presence of different members of our fraternity, with three different thermometers, (Whitney's,) one of which experiments gave 57 pounds pressure at 280 degrees, 73 pounds at 290 degrees, and 90 pounds at 300 degrees, which was as far as I cared to investigate the subject at that time. I make no comments here, further than to suggest that some of our short-time friends have probably got just such a thermometer, and can, of course, save time at the risk of charred work, and of having their heads blown off. The two other trials agreed almost exactly with those to which I have before referred, thus showing that so much of Haswell's tables as I have made use of in connection with this subject is sufficiently correct; theories to the contrary notwithstanding. The fact that my brother, in Philadelphia, finds it necessary to vulcanize at 335 to 340 degrees, while the same thing is done in some other, or even the same place at 300 to 320 degrees, and in about half the time, suggests a lack of uniformity in the graduation of our thermometers, which, if they continue to be used, should be promptly remedied. The gauge is the thing for uniformity, safety and comfort in vulcanizing.

As I shall probably henceforth consider this subject in its application to dentistry quite exhausted, it only remains for me to thank my confreres for their patience with me thus far.

NITROUS OXIDE AS AN ANÆSTHETIC.

BY H. C. ROCKWELL, D. D. S.

While I do not pretend to advocate the indiscriminate use of any anæsthetic, or to state that any, however good, may be used in all cases with safety, yet I have seen so many objections to the use of nitrous oxide, that seem to me fallacious, that I will consider some of them, and try to answer somewhat as I find consistent with my experience.

One objects to the stertorus breathing, (or gasping as he terms it,) which is shown by the patient while under its influence. This is merely consequent upon the position of the mouth and throat while in a state of insensibility, and is no more dangerous than "snoring" in sleep, and should be no more feared. Another states that its effects are due to the carbonic acid thrown from the lungs at each exhalation, and that it alone will not produce anæsthesia. This, even if we did not examine the known difference between its effects and those of carbonic acid, would find sufficient refutation in the fact, that anæsthesia is more quickly produced by inhaling from a large than a small bag, thus breathing less carbonic acid.

Again it is stated that its effects are essentially the same as those of ether and chloroform, with these two drawbacks upon its use, viz:—that the patient is compelled to breathe more or less carbonic acid, and an atmosphere deprived of oxygen. Now there is no doubt that this as well as ether and chloroform are stimulants, yet this possesses a peculiar property, which, setting aside the great law that all stimulants are followed by a corresponding depression, stimulates the patient to insensibility, and without any decrease of vitality leaves the state the same as when the exhibition was commenced. This is supported by Dr. George J. Ziegler, who says: "the physiological influences of nitrous oxide are of a peculiar and striking character, for though like some other agents, it exerts a very energetic and decidedly stimulant action upon the animal economy, yet this is in general so entirely distinct from all other excitants, as to be quite unique;" also, "not being followed by any reactive languor or depression, so common to ordinary stimulants." Thus while the three produce unconsciousness, the effects are "essentially" *different;* for while one produces its effects by elevating the vital action, the others accomplish the same result by depressing it. This has led to the recommendation of the "gas" in cases of asphyxia from chloroform, which certainly would not be applicable if their effects were the same. The drawbacks upon its use may be avoided by allowing the exhalations to pass into the air through a proper mouth-piece. Another objection is, that the patient is entirely shut off from atmospheric air when breathing from a bag. But nitrous oxide is a supporter of combination, (and of course then of respiration, for the process is the same,) and an animal placed in it, like one in an atmosphere of oxygen, will die merely from over stimulation. The vapors of ether and chloroform are not supporters of combustion and respiration, and an animal placed in them will die of suffocation. This, while it would be a strong objection to ether and chloroform, had they to be administered in this way, does not hold good against nitrous oxide, as it is in itself a supporter of life; and while I consider it perfectly safe to a healthy patient, I would take especial pains to give it to no one having any organic disease; thus having secured confidence in myself, I should try and impart the same to the patient, as in this way its exhibition is much more pleasant.

In conclusion, I would say, that having used this anæsthetic for more than a year, with every success, that I consider it superior to ether or chloroform for the purpose of extraction, with these three exceptions, viz: it is more difficult to make and keep, it is more expensive, and its effects pass away more rapidly.

THERESA, N. Y., June 1st, 1865.

DENTAL SUGGESTIONS.

BY JOHN D. WINGATE, D. D. S.

Dentists, hundreds of miles from dental depots, will, when out of nerve brooches, find that sewing needles make a good and very cheap instrument, which may be barbed and hooked. To give body to the annealing part, a package of No. 9 or 10 Sharps, with paper, may be put into a piece of sheet-iron, turned over so as to hold them, and left heat to a cherry-red, then cooled very slowly, will soften them perfectly without blackening, as oxygen has very little chance to change the surface. On the eye end, a little soft solder may be stuck to be retained in the socket. For nerve plugging, a larger needle may be used.

As it is difficult to get *good cotton* now for drying purposes, old linen rags are much better, and even preferable to any of the prepared paper, as they are stronger; cut into strips, tape fashion, and tear off what is needed.

By the recommendation of Dr. H. F. Vallerchamp, I find *liquid silex* the best cast varnish preparatory to vulcanizing. It leaves a much more beautiful surface than collodion. In varnishing or oiling impressions to get the counter-cast, it is best to hold them upside down to prevent the varnish or oil from becoming too thick in the indentations.

Partial impressions may be generally got out of the mouth without breaking, by inserting a squarely-bent wire loop into the impression cup through holes an inch apart, and opposite the highest part of the palate parallel with the mesial line. The ends of the wire, the under side of the cup to be bent down to hold. The height of loop inside the cup should be over half an inch, so as to embrace a goodly thickness of plaster. To remove the cup, straighten the wires, and the impression may be taken out. The wire should be No. 13 annealed iron. The wire should work loosely in the holes, and kept to its intended place with the fingers, from below the cup, while filling with plaster.

The screws of the vulcanite flasks seem, after a few times using, to get too tight; this may be remedied by passing them through a screw plate. The packing around the thermometer is difficult in some boilers to keep tight. To prevent the packing pressing out, small washers of tin plate may be put above and below the packing around the thermometer tube.

BELLEFONTE, PA.

A STRANGE CASE.

BY H. SCOTT, M. D.

The following case occured to me in 1839. Mrs. S. desired me to call at her house, and remove an aching tooth. The one indicated, was the second left upper molar. The gums were inflamed and sensitive, but the tooth was not carious, nor was any one on that side of the jaw; although upon touching them, they were found to be loose. There was not much absorption of the alveolus. The lady was in delicate health, and insisted upon having the tooth removed. I yielded to her wish for reasons of my own. I took hold of it with the forceps, and to my great confusion and astonishment, upon giving it a slight twitch, the two molars, den sapientia, and second bicuspid came away with their entire alveoli. The amount of force used, I am sure, did not exceed five pounds. I hastened to wash the part that had been removed free from blood, when I was surprised to see that there had been no attachment of the alveolar substance to the maxillary bone, except the thin edges, not exceeding the thickness of medium paper. The whole mass slightly dipped into the maxillar, both surfaces being very smooth and covered with periosteum, in which blood-vessels were visible to the unassisted eye. The alveolis were adhering to the fangs when I attempted to separate them, and I could not see that there was any periosteal intervention. The hemorrhage was very profuse, both from the capillaries and dental arteries, so that I had a great deal of trouble in arresting it. I feared to attempt the removal of other teeth, and relied on topical and general treatment to restore her gums to a comparative degree of health. The lady was of strumous habit, and died three years from that time with pulmonary disease. I presented the specimen to a professor of the Cincinnati Dental College. Did any one ever see a similar case?

IRON.

BY T. L. BUCKINGHAM, D. D. S.

A short article on this metal may be interesting to the readers of the Dental Times. It is so much in use, and so constantly met with, we scarcely ever think of its history, properties, or chemical combinations; and so necessary in the arts has it become, that a nation's wealth is now estimated more by the quantity of iron it consumes, than it is by the precious metals it produces.

The question is not easily answered, how and when the ancients began to use iron, either as a metal or in the form of steel? Some writers think that it was not known and used at a very early period, while others contend that the metal was not only known, but was in general use at the very earliest period in the world's history. It was certainly known and worked by some of the nations, as early as any of the other metals; for we read in Genesis iv., 22, "And Zellah, she also bare Tubal Cain, an instructor of every artificer in brass and iron."

Thompson, in his history of chemistry, says: "That in those early days, it is possible native iron may have existed as well as native gold, silver and copper, and in this way Tubal Cain may have become acquainted with its existence and properties." Mr. Napier, in commenting upon this sentence, writes: "This is, however, begging of the question to get over a difficulty; the difficulty being an unwillingness to allow the inhabitants of the earth, then living, to possess a certain kind of knowledge. The suggestion is not very happy, seeing there is scarcely an instance of iron being found native, and only in small portions diffused through rocks, which, even allowing it to have been more abundant in the early ages of man's history, the difficulty of getting it from the matrix would have been about as difficult as reducing it from the ore, except we allow the knowledge of the magnet by which it could be gathered from the rock after being ground, but this would be an admission equally baseless."

After the flood, we find iron frequently spoken of in the Scriptures. "Iron is taken out of the earth," (Job, xxviii., 2,) and Moses uses the iron furnace as an allegorical figure of expression of intense suffering. "But the Lord hath taken you, and brought you forth out of an iron furnace," (Duet., iv., 20.) In referring to the ore in Palestine, "Out of whose hills thou mayest dig iron and brass," (Duet., viii., 9.)

But it is not necessary to refer to more passages to show that iron was known and used in those early times. If we consider the progress they had made in the arts and sciences, especially in architecture, it would be surprising if they had not discovered a process to reduce the ore, and obtain a metal that was essential in building.

Wilkinson, in his *Ancient Egypt*, gives some account of the iron and copper mines of that country. "Iron and copper mines are found in the Egyptian desert, which were worked in old times, and the monuments of Thebes, and even the tombs about Memphis, dating more than 4000 years ago, represent butchers sharpening their knives on a round bar of metal attached to their aprons, which, from its blue color, can only be steel. And the distinction between the bronze and iron weapons in the tombs of Rameses III., one painted red and the other blue, leaves no doubt of both being used at the same period."

That tools of iron or steel are so seldom found about the ruins of ancient buildings or mines, is readily accounted for by the metal being so easily oxidized when exposed to the air and moisture, which in a few years destroys all traces of it. Layard discovered a quantity of iron amongst the rubbish in excavating at ancient Nineveh, in which he recognized the scales of the armor represented on the ancient sculpture. "The iron was so covered with rust, and in so decomposed a state, that I had difficulty in cleaning it from the soil."

Although iron and steel were known by some of the ancient nations, they did not come into general use until about a century before the Christian era, and the natives of this continent did not use them when it was discovered, while the ore was laying around in the largest quantities. But as it is not my intention to write a full history of the metal, we will pass on to a brief outline of the ores, and the process of reducing them.

[TO BE CONTINUED.]

Died, in Lowell, Mass., April 19th, of congestion of the lungs, Dr. Wm. D. Vinal, aged 54 years, 11 months. He had been a practitioner of dentistry in this city for nearly twenty years.

At a meeting of the dentists of Lowell, the following resolutions of respect were adopted:

Whereas, it has pleased the Overruling Providence to remove from our midst Dr. Wm. D. Vinal; therefore

Resolved, That by his death the dental profession has lost a conscientious and worthy member, and Lowell an exemplary and upright citizen.

Resolved, That while we sympathize with his family and friends, in this their sad affliction, we rejoice that they have the consolation of knowing that he had the Christian's hope of a glorious immortality.

Resolved, That a copy of these resolutions be tendered to the family of the deceased, and also published in the papers of the city, and in the various dental journals. A. Lawrence, *Chairman*.

G. A. Gerry, *Secretary*.

AMERICAN DENTAL ASSOCIATION.

The fifth annual meeting of the "American Dental Association," will be held at Chicago, Ill., on Tuesday, July 25, 1865, at 10 o'clock, A. M.

It seems almost unnecessary to impress upon delegates the importance of their presence, since the very large attendance last session was a signal demonstration of the interest and sympathy of the profession, which, of itself, will undoubtedly prove sufficient to establish the popularity of an Association based upon representative interest.

The preparation of voluntary essays is, at this time, urged upon delegates not occupying positions upon any of the various committees, as every such contribution will serve to render the proceedings additionally interesting and profitable.

In connection with the ordinary exercises, clinics will be held, and various dental operations performed.

George W. Ellis, Phila., Cor. Sec.

AMERICAN DENTAL CONVENTION

Meets the first Tuesday in August, at the White Sulphur Springs, in Ohio. This Convention has had a larger attendance than any other dental meeting since it has been established, and as it meets this year at one of the most pleasant places in Ohio, the Convention will probably be larger than it ever has been.

Editorial.

SALUTATORY.

The present number commences the third volume of the Dental Times, and, as customary, the publishers consider it appropriate to take retrospective glance at the past, as well as to form plans for the future. In a former communication, at the commencement of one of the preceding volumes, we promised to the dental public a quarterly magazine devoted to the interest of the Dental Profession, and composed exclusively of original articles on dental subjects. We have adhered to that plan up to the present time, through the kindness of our contributors, (to whom we return our thanks,) and our own exertions; and we believe we can justly claim to have furnished more original matter for the price paid than any dental journal published in the United States. We still intend to adhere as closely as possible to the plan previously adopted, viz: the presentation of original communications; but shall modify it so far as may seem advantageous to our readers, by making selections from our American and foreign dental publications.

In conclusion, we urge those interested in dental advancement to send to us their accumulated knowledge on dental subjects, that they may in part return that information which has been freely given to them, and which may prove not only profitable to those who give, but as well to those who receive. The subscription price to the Dental Times will remain as formerly, at the low price of one dollar per annum, in advance. Communications to be addressed to Dr. T. L. Buckingham, 243 North Ninth street, Philadelphia.

A New Instrument for the Laboratory.—Dr. John Q. Birkey, of this city, has constructed an apparatus for heating water, sets of teeth preparatory to soldering, for tempering instruments, &c.; it has a sand bath, a very useful appendage, attached to it. The instrument is small, simple in construction, not liable to get out of order, produces perfect combustion, consequently evolves the greatest amount of heat that can be obtained from the combustible. It is decidedly the best apparatus that we have yet seen for generating heat from gas. E. W.

☞ We commend to notice in the present number a communication on Nitrous Oxide, by our former student, Dr. H. C. Rockwell; though differing decidedly from him in his conclusions as to its safety and value as an anæsthetic, we consider it to be the most logical and reasonable article yet presented to the dental public in favor of Nitrous Oxide. G. T. B.

☞ For the information of those who intend to be present at the next annual meeting of the American Dental Association, to be held in Chicago, Ill., we would state that we have been informed that communication is exceedingly easy between that point and White Sulphur Springs, Ohio, so that those desiring so to do, may be present at the meeting of the American Dental Convention the following week. G. T. B.

☞ *The Dental Quarterly*, Vol. IV., No. 2, comes to us as usual laden with valuable dental information. It is worthy of the enterprising firm, Messrs. Johnson and Lund, from whom it emanates. G. T. B.

☞ The second annual meeting of the Central States Association of Dental Surgeons will be held in this city, at the Kentucky Medical College, commencing on Tuesday, July 18th, at 10 o'clock, A. M.

W. H. Shadoan, Secretary.

Louisville, Ky., June 1, 1865.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE TENTH ANNUAL SESSION, 1865-'66.

TRUSTEES.

HENRY C. CAREY, President,
W. L. ATLEE, M. D.,
DANIEL NEALL, D. D. S.,
ELLESLIE WALLACE, M. D.,
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GEORGE TRUMAN, M. D.,
S. DILLINGHAM, D. D. S.,
G. R. MOREHOUSE, M. D.,
THOMAS WOOD,
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CHARLES HAMILTON, Sec'y.

FACULTY.

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C. N. PEIRCE, D. D. S.,

EMERITUS PROFESSOR OF OPERATIVE DENTISTRY.

T. L. BUCKINGHAM, D. D. S.,

PROFESSOR OF CHEMISTRY AND METALLURGY.

E. WILDMAN, D. D. S.,

PROFESSOR OF MECHANICAL DENTISTRY.

G. T. BARKER, D. D. S.,

PROFESSOR OF PRINCIPLES OF DENTAL SURGERY AND THERAPEUTICS.

W. S. FORBES, M. D., D. D. S.,

PROFESSOR OF ANATOMY AND PHYSIOLOGY.

JAMES TRUMAN, D. D. S.,

PROFESSOR OF DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

EDWIN T. DARBY, D. D. S.,

DEMONSTRATOR OF OPERATIVE DENTISTRY.

J. M. BARSTOW,

DEMONSTRATOR OF MECHANICAL DENTISTRY.

The Lectures to the Regular Course will commence on the 1st of November and continue until the 1st of March.

During the last two weeks of October, preliminary Lectures are delivered, one each day.

The Rooms for Operative and Mechanical Dentistry are open from the 1st of October and throughout the session, under the supervision of the Demonstrators.

The Dissecting Room, under the superintendence of the Professor of Anatomy and Physiology, is open during the session.

Fees for the Course, (Demonstrators' Ticket included,) -	$100
Matriculation, (paid but once,) - - - -	5
Diploma Fee, - - - - - -	30

T. L. BUCKINGHAM, Dean,

C. P. REESS, Janitor. **243 North Ninth St., Philadelphia.**

P. S.—Board may be had at from $3.50 to $6.00 per week.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Tenth Annual Session, 1865-'66.

The tenth annual session of the Pennsylvania College of Dental Surgery will commence on the first of November, and continue until the first of March. Preliminary lectures will, however, be delivered each day during the latter half of the month of October. The Dispensary and Laboratory of the College will also be open from that time, where ample opportunities will be afforded for the prosecution of the practical part of the profession under the daily supervision of the Demonstrators, who are gentlemen of known integrity and thorough capability. During October, as well as the entire session, a clinical lecture will be delivered, and operations performed by one of the Professors every Saturday afternoon.

The course is so arranged that fifteen lectures are delivered each week, on the various branches taught in the school. A synopsis of the manner in which each department is treated will be found under the head of the different chairs.

These lectures occupy about the average time of three hours each day. In addition, four hours are daily spent by the student in actual practice. With this object in view, the operating rooms are furnished with twenty chairs, so arranged as to command the best light, and all the appliances necessary for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate.

Each student is required to provide his own instruments, (except those for extracting,) and to operate with them. He is expected to keep them in perfect order, and for that purpose is provided with a table in which they can be locked up when not in use. As the operations performed a the College are entirely gratuitous, a superabundance of patients invar ably present themselves.

In the mechanical department every process known in the profession, which has any value to the mechanical dentist, is fully taught; and receipts of valuable compounds are freely imparted. All the conveniences are at hand in the Laboratory for the preparation of metals, manufacture of teeth, (single and in blocks,) mounting, etc.; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression to the thorough construction of the denture, and proper adjustment of it in the mouth of the patient.

In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of Dentistry, the celebrated hospitals and clinics of the city constantly enable the student to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Blockley Hospital, in particular, one of the largest eleemosynary establishments in the world, are open to Medical and Dental students, free of charge. The staff of this institution is composed of some of the most eminent physicians and surgeons of Philadelphia.

COURSE OF LECTURES.

CHEMISTRY AND METALLURGY.

The course of instruction from this chair will commence with the consideration of the imponderable substances.

The laws that govern the imponderable bodies will next claim attention, with some notice of symbols or chemical notations. Individual elements, and the compounds resulting from their combinations, will then be considered. Organic chemistry will receive its full share of attention.

The course will be illustrated by diagrams and such experiments as can be performed before the class.

DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

The lectures in this department will embrace the Physiological Anatomy of the teeth, general and microscopical, in addition to a minute and careful description of the various operations performed by the dental practitioner.

The microscope, models and diagrams, will be employed in illustration.

At the Clinic the incumbent of this chair will also demonstrate before the class the various operations described in his course of lectures.

MECHANICAL DENTISTRY.

The instruction from this chair will embrace the entire range of manipulations legitimately connected with the laboratory, arranged in two divisions—Mechanical Dentistry proper, and that to which has been applied the appellation of the Plastic department.

I. *Mechanical dentistry proper* will include everything appertaining to the construction of dental substitutes, passing through the different stages of preparation, from taking the impression, to the completion and proper adjustment of the case in the mouth, conjointly with features, expression of countenance, enunciation, etc. It will likewise embrace the metallurgic treatment of the various metals employed, the preparation of plate and wire, the alloying of gold, together with the *alloys* used, as well as those designated as solders.

II. This division will comprise all that appropriately belongs to the manufacture of porcelain or mineral teeth—single teeth, block-work, continuous gum-work, vulcanite, etc. The materials, their preparation, compounds and uses, will be specially regarded.

All new inventions, modifications, and improvements, in this branch of the art, will in place receive due attention and investigation.

PRINCIPLES OF DENTAL SURGERY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist.

They will also include a careful examination of therapeutic agents and their general application. Their indications in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated, and also the general hygienic rules and principles which come within the province of the practitioner.

ANATOMY AND PHYSIOLOGY.

The instruction in this department will embrace a plain and comprehensive view of the structure and functions of the Human Economy. The valuable anatomical preparations of the incumbent of this chair, (consisting of Papier Mache manikins, models in wood, drawings, wet and dry preparations,) will enable him to fully illustrate his course. With the same object, vivisections on the lower animals will also be employed.

The special relations of this branch to the wants of the dentist will be kept steadily in view, and such descriptions of the natural history, microscopical structure, connections, &c., of the teeth, as their importance demands, will be given.

The great facilities for the study of practical anatomy, to be found in the city of Philadelphia, obviate the necessity of providing a dissecting-

room in the College. For the usual fee of $10, the student can have access to one of several well-ordered and well-supplied dissecting-rooms.

REGULATIONS.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College; five years' practice, inclusive of the term of pupilage, will also be considered equivalent to the first course of lectures. The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done, at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees; and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

TEXT BOOKS AND WORKS OF REFERENCE.

Wilson's, or Leidy's Sharpey & Quains' Anatomy; Carpenter's Physiology, or Dunglison's Human Physiology; United States Dispensatory; Mitchell's Materia Medica; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Pysiological Chemistry; C. J. B. Williams' Principles of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Paget's Surgical Pathology, or other standard works on the subject.

THE

DENTAL TIMES.

VOL. III. PHILADELPHIA, OCTOBER, 1865. No. 2.

SPECIALTIES AND SPECIALISTS IN MEDICINE.

BY DANIEL BRAINARD, M. D.,

Professor of Surgery in Rush Medical College, Chicago.

Delivered before the American Dental Association. in Chicago, July 26th, 1865.

Gentlemen of the American Dental Association:

It gives me great pleasure to meet here the members of so honorable and useful a profession as yours. The profession of dentistry is one of very modern origin, and is that branch of the medical profession which owes its development and perfection most essentially to our own country, and is, indeed, I think I may say, the one branch of the profession in which we Americans can claim especially the pre-eminence. To be an American dentist is a recommendation in all the principal cities of Europe, and although the medical profession in general, and the surgical department especially, has an honorable position in the literature and among the profession in foreign countries, it can hardly be said to have a claim to the title of any pre-eminence.

I have said that your profession was of comparatively recent origin. It is almost, I think, within the memory of many persons here present when it was regarded as merely a mechanical operation, little better than the higher branches of mechanical employment. Step by step it has developed itself to a degree that, in perfection, in usefulness, it does not, in my opinion, rank second to any of the single branches of medical or surgical science, [applause;] so that at the present day, to be without a dentist would be to be without one of the essentials of civilized life. [Renewed applause.]

Now, in speaking of its having a mechanical origin, I do not intend anything disrespectful to it. My own especial branch of the profession is surgery, and, I might say, a part of surgery; and it is not very long since surgeons, as a class, occupied a position far less honorable and important than that occupied by dentists of the present day. In the middle ages in Europe, so called, or rather in the latter part of the middle ages, from the fourteenth to the end of the fifteenth century, or thereabouts, surgical operations were performed by barbers. There was no distinction between those that performed a surgical operation and those that cut hair, and curled hair, and powdered hair. The duty of the surgeon was considered to be to perform an operation when he was directed, and as he was directed by a physician, and, when he had performed the operation, to retire and leave the case to the physician. And it happened, after a certain period of time, that these operators acquired a certain amount of knowledge beyond the immediate needs of operating, and were called upon to advise about operations, and about the treatment of cases after operations. And this was considered a great innovation upon the profession. It was considered something outrageous and disgraceful to the profession ; and the man who should have consented to meet a surgeon in consultation, would have been expelled from the faculty for consulting with a quack. I have in my library a work published by the President of the Faculty of Medicine, in Paris, entitled "*The Brigandage of Surgeons*," setting forth that they were asserting claims which, if allowed, would be the destruction and disgrace of the medical profession.

BOSTON MED. LIBRARY JUL 31 1891

This comparison I bring forward for the purpose of sustaining the assertion that I make, that the difficulties under which the dental profession labors are nothing new. By speaking of the difficulties under which you labor, I mean this : the difficulty and length of time which it has taken for the honorable, and educated, and competent men of that profession, to assert and maintain full equality in professional standing with members of the medical profession who practice other branches of it. That difficulty has existed in regard to every particular branch of the profession that has at any time been embraced by any particular class of men, and is not peculiar to the dental profession. It results from that deep-seated prejudice, for I can call it by no other name, that has existed from the earliest times, and is inherent apparently in the nature of every profession, and that is, to resist innovations or changes in regard to the doctrines or the practices of that profession. This peculiar aversion to changes results from the nature of professional education, and is one of those things that is treated of by Lord Bacon in his *Novum Organum*, under the name of "Idols of a Class," or those things which prevent members of a particular class from seeing the truth in regard to their own profession. It is, and has been, one of the great obstacles to the progress of the medical profession. It is an obstacle which at the present day is partially, but only partially, overcome. It is the thing which has prevented a large number of men of genius and industry in the profession from embracing and following out the study and practice of a particular class of diseases, in such a way as to have perfected our knowledge of the nature and treatment of such diseases.

Now, the principle that I wish particularly to assert here is this, that the medical profession, in order to be most useful, in order to acquire its due influence over the community, in order to perfect its knowledge of the nature and treatment of diseases, must adopt a special course of study; each individual member embracing that course which he judges on the whole to be best adapted to his faculties, and leaving out, to a certain extent, others for which he has no qualifications. I advocate special studies and special practice; and, although the words have been somewhat discredited, I advocate "specialties" and "specialists."

Now, I undertake to say, that the very great opposition which this doctrine has met in the profession, is not founded upon reason or justified by the experience of the profession. It is an opposition which is working to the disadvantage of the profession as well as the public, and to the manifest disadvantage of a very great number of the individual members of the profession; and therefore I wish to insist a little upon the point.

What are the natural divisions of the science and practice of medicine? Is there no natural division? I hardly think that any one would be so bold as to assert that there are, and ought to be, no natural divisions. For a long time, when the science of medicine was in a very rude and imperfect state, the members of that profession did study and practice all its branches; and in the older works on surgery, pharmacy and chemistry were as much treated of as the operations of surgery. Still, even at that time, there was the commencement of division, and the first was into pharmacy, surgery, and obstetrics. The next division which came was into medicine and surgery, surgery being, as I have stated, the mechanical application in the manner already indicated. At a later period, there commenced to be apparent the distinction between the obstetrical department of the profession, and separation between pharmacy and medicine was accomplished entirely. By degrees the distinction between obstetricians and medical practitioners came to be recognized in particular localities, in large cities especially, to a very considerable extent; so that medicine, towards the middle of the last century, might be said to be divided into pharmacy, medical practice, properly so called, surgery, and obstetrical practice; whilst yet it remained true in regard to the greater portion of the civilized world—the country in general, in America, as well as in Europe—that the larger number of practitioners continued to practice all its branches, to collect and prepare their own medicines, to practice pharmacy, surgery and obstetrics. And at the present day, this is the case with a very large part of the profession throughout the civilized world.

Now, it is manifest, all experience and reason show, that men who practice medicine in this way, practice it only in a rude and imperfect manner; that they neither understand pharmacy, nor medicine, nor obstetrics;

that, from the nature of things, they are incapable of acquiring skill in any one of those branches; that it is absolutely necessary, in order that there should be any progress in regard to the science or practice of medicine, that some of these should be excluded, and others proceeded with especially, by each individual member of the profession.

Let us examine the question for a moment. The dentists, as a body, have, according to my own knowledge and observation, perfected the mechanical means of performing operations beyond what has been done in any other branch of the profession. They are better mechanics than the surgeons, and their instruments for accomplishing the different objects which they have in view are more numerous and better suited to their purpose than are the instruments of surgeons. Now this is essential to the proper performance of dental operations. And how has this happened? It has been simply that there have been dentists, as a class, who have devoted their attention to that purpose; and we, as surgeons, never could have invented or perfected these instruments, and consequently could never have perfected dentistry. And that division of labor is a thing which, at the present day, is manifestly necessary, and which no one now disputes.

In regard to surgical instruments, there are two departments in which they have been singularly perfected. The one is in regard to those instruments which are used for crushing urinary calculi, which are the most admirably adapted to their purpose. How did that come about? Three men of genius at the same time happened to devote their whole attention to that thing, the crushing of stone, and they especially perfected those instruments. And without that perfection of these instruments, the crushing of urinary calculi must have remained for ever, as it had up to that time, a mere phantom floating in the mind without any practical application whatever. Therefore it was necessary in this particular that there should be special studies. The other branch in which I consider the mechanical means to be wonderfully perfected, is that regarding instruments for operations upon the eye. These instruments have been brought to such a degree of perfection, of delicacy and accuracy, that they are capable of accomplishing things almost inconceivable, and accomplishing them regularly, constantly, and without difficulty or danger. Now, how has this happened? It has happened in the same way; there have been a class of men who have devoted their attention to that subject exclusively, have thought of nothing else, have worked at nothing else but the perfection of means for the accomplishment of that which they saw before them to be done. But when you come to other things that have not been made specialties, the condition of our science is singularly rude and imperfect. There is nothing in our science at the present day which has the slightest claim to be a respectable apparatus for the treatment of fractures. Particular individuals, by the attention which they have paid to it, and by an excess of superior mechanical talent or ingenuity, have been able to accomplish with the instruments which they use a considerable degree of success; but there is no instrument for any given fracture that can be mentioned, that can be taken by a person of ordinary good education of the profession, and put upon the member in such a manner as to accomplish any perfect result. The greater number of instruments which are used in the profession, for fractures of the leg, and called "fracture boxes," are not anything better than dry goods boxes, [applause,] and simply serve to accomplish the result of concealing from the surgeon the position in which a limb may happen to lie. [Renewed applause.] What is the reason of that? The reason is, that there never has been as yet any instance that a man devoted himself to fractures as a specialty, and nothing else, and this is the one branch in which a specialty is most needed. They are the species of accident which are the most frequent, and which disable a man more than any other, and entail untold miseries upon him if unskillfully treated; but the instruments for the accomplishment of this purpose never will be reduced to any great perfection, until it shall be known that the devoting of time and talents to one subject leads to honor, and not to being partially thrown out of the profession. [Applause.]

If I should be unfortunate enough to meet with a fracture of the jaw, the first thing I should do would be not to send for a surgeon at all. I should send for a dentist. [Cheers.] They have directed their attention to the mechanical means and apparatus necessary for holding the jaws in their place, to such an extent, that they are better qualified to make them than surgeons are as a general thing, and, perhaps I might say, more than any surgeons are.

I might go on and point out to you that with regard to no one thing about them are the instruments used by surgeons the best adapted to their purposes.

We are disputing, at the present day, all over the world, what kind of sutures are the best to use. A great many of our instruments for the purpose of ligating arteries and performing similar operations, are singularly rude and imperfect, and their imperfection is only remedied by the skillful use of the fingers of the surgeon.

How is this to be remedied? It is to be remedied, gentlemen, by special study; by the profession changing its views upon that subject, and saying to the young men, when they are entering the profession, and when they are about to leave the schools, that it is better for them to devote themselves to some particular branch of the profession, and try to understand it. I often have young men from various parts of this country, who are here to visit the West for the purpose of locating themselves in their practice. They very frequently come to Chicago, and we are always glad to see them. We are very proud of our city, and if you want to get into the good graces of any Chicago man or woman, you have nothing else to do but to tell them it is a nice place. [Laughter.] But these young men come here, and they say: "What kind of a place is Chicago for a professional man?" Now that is a very hard question to answer, because politeness does not permit me to ask another question. I could say to the young man, that if you know any one thing better than the generality of the profession, it is a good place for you; but if you do not, it will be a bad place for you. And for those young men who are incapable of applying their knowledge in such a way as to earn their daily bread, incapable of using their knowledge for the benefit of any particular class of men, so as to make it desirable for them to call upon them, Chicago is not the place. That is the difficulty under which members of the profession labor when they would enter into practice.

How is this to be remedied? It is to be remedied, in the first place, by acting upon public opinion. The profession which listens with leaden ears to the propositions which come from members of it to change the time-honored usages to which it is subjected, is sensitively alive to intimations which come from the people who employ them. Public opinion in this country is law, and in order that the laws be made good, public opinion must be enlightened. Individuals are powerless, but ideas are irresistible; and the way to remedy it is to take the idea or fact that, in order to make the profession useful and powerful, it must be developed and perfected in all its branches, constituting each one of these branches one body, each part of which co-operates in its proper sphere and most useful manner in advancing the interests of the whole profession. [Cheers.]

Now, in saying that I am in favor of special studies and practice, in that way, I do not commit myself to anything; and the profession won't regard this as anything but a "glittering generality." Therefore, I state, that I think there ought to be dentists to attend to the teeth, oculists to attend to the eye, aurists to attend to the ear, and special physicians to attend to the diseases of the heart and lungs, and make the physical examinations which are so difficult, and a special class who will be able to use the microscope for special examinations; that there should be not only practitioners of obstetrics, but those especially devoted to different branches; I mean that the incapable obstetrical practitioners never should be allowed to use instruments; that there should be men qualified for that. And then in regard to surgery, that it should, in addition, have a number of branches. That in these there should be one branch devoted especially to the treatment of fractures. That there should be another branch devoted to the treatment of tumors, without absolutely circumscribing these departments by definite lines at the present time. When that is done, then the profession will cease to occupy the principal part of the time in its meetings or associations with quarreling with quacks. The man who is thoroughly accomplished in any particular department of his profession, is very little troubled by quacks. [Applause.] Then the public will come to know the usefulness of the profession.

The dental profession, at the present time, is not consulted in one case in a hundred, or one in a thousand of those which require the care of a dentist. That is because the medical profession is not educated to the proper standard, and does not tell these people, as they ought to do, that in cases of difficulties about the teeth, they should apply to a good dentist.

The same is true in regard to surgery. There are operations enough that ought to be performed, in every populous county in the State of Illinois, and which are not performed, to give employment to all the surgeons in those counties. They do not know that there is any man who applies himself to that particular kind of disease, and when they look around for information they look to that particular kind of advertisements in the newspapers; and you know what kind of information they get there. [Laughter.] I repeat, then, that the way of progress in the medical profession is in the way of special studies.

How is this to be brought about? I would not have you to suppose, by any means, that there should be a special school for every department of medicine and surgery. On the contrary, I would very much prefer that there should be no division whatever. And if I might be permitted to express an opinion upon a subject which may be delicate, it would be an opinion with regard to the dental profession, that they had better not be separated from the medical profession. I think it would be better for them to receive their education in the same schools and to the same extent as other members of the profession. And I think that in order to effect their education there ought to be and will be, perhaps not in my day, but there will be professorships of diseases of the teeth in every respectable medical school in Christendom. [Cheers.] What is taught at the present time in most medical schools in regard to teeth, is the order and time of dentition; and then, in case the child is sick during that period, that the gums are to be lanced. [Laughter.] In some schools there is a little advance upon that. But there is no medical school, so far as I have any knowledge, where the diseases of the teeth, and the causes which produce them, the means of obviating them, the irregularities of the teeth, and the means of correcting them, the best thing to do in case of any particular appearances of the teeth; I am not aware that in any institution, even to that extent, is it properly taught.

Of course there must be colleges of dental surgery, so long as dental surgery cannot be learned elsewhere. This is a want, and, until we can supply it, the practice of surgery must be necessarily more or less imperfect. It is necessary, in my opinion, that the dentist should be an educated physician. [Cheers.] It is necessary that he should understand the structure of the body beyond the teeth. [Cheers.] And I will mention this curious thing about anatomy and quackery. Anatomy in itself would not seem to teach a man much of a practical nature; but I have never yet seen an accomplished anatomist who was a quack, or a quack who was an anatomist. There is an incompatibility between the pursuit of that sublime science, which makes the two incompatible; and if you will fetch before me any man, whether he be a dentist or otherwise, and he will tell me all that is known in reference to anatomy, I will accept that man as a scientific man, without asking him another question. [Laughter and applause.] That is the foundation of all medical science, and therefore you must have that; and you must have, in addition to that, the knowledge of physiology. You must have an especial knowledge of the action of medicines, as they operate upon the human system, not to speak of those other branches of science and accomplishments, outside the profession, strictly so-called, which are so necessary to give influence to science, to render man happy, to adorn his life, and make him a gentleman. I would have, in the first place, all the different classes of the medical profession educated in the same schools, to the extent of acquiring this general knowledge of which I have just spoken; and then I would have in each college not only a professor of diseases of the teeth, but I would have a special professor with regard to a certain number of other branches, at present of the diseases of the eye and ear, and of the nature and treatment of deformities of every kind. These branches have all acquired a degree of development which requires them to be treated from separate chairs; and when the student had got sufficiently accomplished in general principles, I would have him adopt that branch which he proposes to follow, and devote his special attention to it; and I would have these new chairs instituted from time to time as the wants of the community seem to require.

Medical science, which two hundred years ago was imperfect, has, at the present time, acquired a degree of development which renders it impossible that any one should master it in all its details. No intelligent man, devoting his time to it, can read all the works connected with it that appear in the English, German and French languages, from one end of the year to the other. It is a physical impossibility. It is a physica labor that he could not endure. How, then, is he to become acquainted with the details of all the different branches, able to perform every kind of operation, able to prescribe for every kind of disease? In proportion as the science advances, it will become still more extended and difficult. As each science is perfected, this is the rule. There will be further advances, which, at the present day, it will be unwise, if not impracticable, to define.

I have said that the profession, organized in the manner in which I propose, should be formed of parts not in conflict with each other, but should constitute one harmonious whole. The dentists are capable of exercising a great influence upon society. They are a numerous, enlightened, and I am happy to say, wealthy and influential body of men, and we, with all our prejudices, cannot afford to leave them separate and standing off. [Laughter.] The physicians and surgeons are capable of exercising a great influence in favor of the dentists, and they would, if better informed and more enlightened, exercise a greater influence than they do, by directing their patients always to apply to them for advice with reference to every question which might arise as to the teeth. This would be an advantage to the dental profession, and they would get it to a much greater extent if they were a recognized part of the medical profession, as they deserve to be. So with all the other different specialties; and whenever I see a man taking up one of these specialties, and for years together undertaking the labor connected with it, I say, "Go ahead, do what you can in that branch of the profession." I do not regard him as in any degree conflicting with my own or any other branch of the profession; I am happy to see it, and I carry my approval to the extent of recognizing the principle in branches of the profession of which I might have, myself, some little doubts; such branches as the application of electricity to diseases, about which our information is so imperfect and indefinite. I consider that the application of electricity, by an intelligent man, would probably be of great use, and, therefore, when a man undertakes that specialty, I think he enters upon a useful work, and one that it is necessary to make a specialty of before it can be relied upon by the profession generally. It is the same with regard to another class of practitioners—the movement-cure men. That term—"Swedish movement cure"—is an unfortunate name. The method of treatment to which it is applied did not originate in Sweden, but is founded upon the principles of physiology, justified by experience, incapable of being applied by practitioners who have not the necessary knowledge, and promising, in the future, as it shall be developed, the relief of a large class of diseases which have been, heretofore, and which are, at the present time, to a great extent, beyond the reach of surgical treatment.

These, gentlemen, are the essential outlines of the ideas which I wished to present to you. "A word to the wise is sufficient," and therefore I need not dwell upon them. It has given me great pleasure to know that this convention was a successful convention, and that it was attended by a large number of men from various and distant parts of the country. You have already received a welcome from your own profession here; that welcome was only the expression of the feelings of the general community with regard to yourselves and every other body which comes here for purposes so useful and honorable as yours, and therefore, from the harmony of your sessions, I have only to hope that it may be useful, interesting and improving, and if you ever need a place to meet in on another occasion, I would take the opportunity of asking you, on behalf of the medical profession and our citizens, to come back to Chicago. [Loud cheers.]

ARSENIC.

BY H. C. ROCKWELL, D. D. S.

This substance, until lately classed with the metals, is now generally regarded as a metalloid, or non-metallic element. It was known to the ancients, but was demonstrated to us by Brandt, in 1733. It presents, when pure, a crystalline, steel, gray-colored mass, which may be volatilized at about 360° Fahr., and will be known by the strong odor of garlic, which it emits. It is sometimes found native, but generally mixed with the ores of cobalt, and sometimes with those of iron. It may be obtained by roasting the ores, and subliming the oxyd thus obtained in a flask with oil at a low red heat, or by heating in a crucible, with a flux composed of one part nitre, and two of crystals of tartar, having another luted over it to receive the substance, as it becomes deoxydized. It is about five times as heavy as water, and is entirely inert. It forms two compounds with oxygen, both of which are acids, viz: arsenious acid, ($As\,O_3$,) and arsenic acid, ($As\,O_5$.)

Arsenic acid, composed of one equivalent of arsenic and five of oxygen, is a white substance with a sour metallic taste, and is an active poison. It is of little use in the arts, and is of no importance in dentistry. It may be procured by dissolving one part of arsenious acid in six of concentrated nitric, and evaporating the solution.

Arsenious acid, composed of one part arsenic, and three of oxygen, is, when first obtained, nearly transparent, but, after remaining sometime, becomes opaque, and is generally found as a white powder, with no perceptible smell, and a slightly sweetish taste. This is the common white arsenic of the shops, and is a virulent poison. It acts as a poison, not only when taken into the stomach, but also when applied to the skin or mucous membrane, or when any of its fumes are inhaled. It is slightly soluble, cold water taking up about 12 parts in 1000, and boiling 70 to 80 in the same. Its specific gravity is about 3.7. It is obtained by roasting the ores of cobalt, and resubliming in closed crucibles, at a red heat. This is always the product when metallic arsenic is heated. It is frequently adulerated with chalk, and other substances. These may be easily detected by heating, as the arsenic will be sublimed, leaving the foreign materials.

There are three liquid tests for arsenious acid, viz: sulphuretted hydrogen gas, nitrate of silver, and nitrate of copper. Impregnate some water with the first, and after acidulating slightly with acetic acid, it will throw down a yellow precipitate, which is commonly known as *orpiment*, or king's yellow, and is used in painting. With nitrate of silver, by adding a little ammonia, it will also throw down a yellow precipitate, which is the arsenite of silver. With nitrate of copper, also adding some ammonia, it will throw down a bright green precipitate, which is arsenite of copper, or Scheele's green, much used for coloring paper, and as a paint.

Another, known as "Marsh's test," is as follows: take the ordinary apparatus for generating hydrogen gas. By placing a substance supposed to contain arsenious acid in this, and holding a porcelain slab in the flame, if any is present, a deposit of metallic arsenic will be formed. It may also be collected in a glass tube, and oxydized in the flame of a lamp, when the peculiar garlicky odor may be perceived. This may be dissolved and tried by the liquid tests if necessary. Great care must be used to have the zinc and acid perfectly pure, and the flame should be tried by the slab, before the substance to be tested is introduced. Another test is by heating a sheet of copper foil in the liquid suspected, after acidulating with hydrochloric acid. The arsenic will be deposited as a white alloy on the surface of the copper, and may be sublimed and tested.

The antidote to arsenious acid is the hydrated sesquioxyd of iron, and should be administered, after evacuating the stomach, if possible, in doses of a teaspoonful every five minutes, until more than twelve times the amount of arsenic taken is given. This acts by transferring two equivalents of oxygen to the arsenious acid, forming arsenic acid, which unites with the proto-oxyd of iron remaining, and forms an insoluble compound.

The medical properties of arsenious acid are alterative. It has been used in fevers, and is very effectual in obstinate eruptions of the skin. It is officinal as *acidium arseniosum*, and is given in doses of about one-twentieth of a grain. It is much used in combination with potassa, called "Fowler's solution," officinal as *liquor potussæ arsenitis*. Arsenious acid has been applied externally to ulcers, &c., and is the "Samson" of the "cancer doctor," by whom it is liberally used. The reason why it does not prove fatal in many cases, is probably because so large a quantity is applied.

The precise manner of its action, when in contact with a part, is a matter of dispute. It acts primarily, by causing its absolute death, probably by over stimulation. It is used in dentistry for destroying the vitality of the dental pulp, and for reducing the sensibility of dentine. If used for the latter purpose it should be with extreme care, and many of our best practitioners entirely exclude it from their practice for that purpose, as they hold that in most cases, death of the pulp will result, sooner or later. It was first recommended for destroying the pulp by Dr. Spooner, of Montreal.

It is sometimes used in the form of powder, but more commonly in a paste with creasote, and sulphate, or acetate of morphia. The formula varies from two parts of arsenious acid and one of morphia, to two parts of the latter, and one of the former. The writer prefers one composed of equal parts of each. It should be applied directly to the exposed nerve, and covered with wax, or cotton saturated with sandarac varnish, and allowed to remain from twelve to thirty-six hours. Some writers assert that it may remain with impunity any length of time, if a proper quantity be used; but it is so extremely difficult to obtain the exact amount, that it is well to be on the safe side, and remove as soon as the desired result is accomplished. From the fortieth to the sixtieth of a grain will probably destroy the pulp, under favorable circumstances. In using, should any escape and cause inflammation of the mucous membrane, it may be treated with nitrate of potassa, with favorable results. It is better, however, to have the paste so thick, that a small portion may be taken on the point of an excavator and placed in direct contact with the nerve; as in this way it is more easy to obtain the quantity desired. The cotton and sandarac should be packed lightly into the cavity, as too great pressure will cause pain. If the nerve is inflamed, it will be better to treat with the morphia alone, for twenty-four or forty-eight hours, and afterwards apply the paste. The paste should be kept in a shallow jar, so that the pledget of cotton may penetrate nearly to the bottom, as, after standing a short time, the different ingredients assume positions corresponding with their specific gravities.

Arsenic, and arsenious acid, form many combinations with other elements, those of the former known as "arseniurets," and those of the latter as "arsenites," none of which are of particular importance to us, as dentists.

THERESA, September 5, 1865.

POPULAR DENTAL EDUCATION.

BY A. LAWRENCE.

Popular education is generally a favorite theme. Descanting philanthropists grow prosy thereon,—the poet sings of the millenium, and all the world says amen for the consummation of any measures requisite to secure so desirable an object: yet, with all the expenditure of pence and pathos, we find very little accomplished beyond the legitimate sphere of the common schools, academies and colleges. This is particularly the case in all attempts to educate the people in specialties.

For more than eighteen hundred years a class of men have labored in the specialty of teaching men the way to eternal salvation, with, it is feared, a somewhat limited success. If, then, matters of such weighty import fail to receive the attention due, in how much less may we expect comparatively insignificant interests to absorb the public mind? The study of the teeth, their diseases and treatment, has from time to time been urged upon the people by some very good men of the dental profession, but the apathy in that direction is too apparent to hope for much progress. One says, write short essays, and publish them in pamphlet form for distribution. Another says, talk instructively to the patient while in the chair—at home, abroad or anywhere; and still another says, publish short articles on dental matters in the newspapers.

The difficulty about the whole is, the people will couple the trumpet, or the pronoun of the first person singular, with all such efforts, even though honestly and unselfishly put forth. My suggestion is, to *publish a better practice.*

To such teaching a willing people will give full credence, and cheerfully award a liberal salary to the tutor. The indisputable fact is, that the people require unlearning of much they have already learned by bitter experience in regard to practical dentistry. I do not intend to convey the impression that *correct* dental practice has prejudiced the public mind, but that such dentistry, in the aggregate, as the public have endured for the past thirty or more years, has not been of a character to challenge much respect. Every city, town and hamlet, has its story of broken jaws—of teeth that filling would not benefit; and in some families the same bungling set of teeth continue to be worn by generation after generation, descending as an heir-loom from father to son, and from mother to daughter or granddaughter, fitting all equally well. Apropos to this: I had a request not long since by a lady, to make some *very slight* alterations in an upper set of teeth, so that they would "stick a little better to her mouth," averring that they were made for her grandmother, and after her death were worn by the mother of the patient with as little apparent inconvenience as the grandmother experienced; but her own mouth was somehow so peculiar, so unaccommodating, as to not retain the plate so firmly as did a neighbor's, hence the application to me. I am sorry to say I had not the requisite skill to accomplish so much as desired, within the limits the fair patient considered sufficient, and she retired, probably designing to continue wearing the teeth, although half of them were broken, and perhaps eventually leave them as a rich legacy to the next of kin, "their assigns and successors, to have and to hold, as aforesaid, for ever."

I have no comments to make on the case referred to—if others have, let them.

"Ever let the fancy roam."

Is there a dentist in the country, of five years experience, who is not occasionally told by some visitor that filling don't do their teeth any good, and that they do not want any of them filled for that reason? Expostulation or explanation are of no avail,—they have "had them filled once by a dentist who was considered good, but the filling all came out, and they will try it no more." Nothing but those "glittering generalities," artificial teeth, will satisfy their desires, and all talking is mercenary and for Buncombe. How have such patients learned that to which they adhere with such pertinacity? The only source from which such astuteness can flow is presided over by the genius of heedless or dishonest quackery, and to unlearn such patients is no easy matter, particularly if, as is generally the case, they utterly refuse to be undeceived by testing a good operation.

I apprehend that, to disabuse the public, by bringing up the standard of operative excellence to anything like general acceptance, will require years yet to come of persistent effort on the part of the high-minded and honorable of the profession.

It is the rank and file of dentists themselves who most need educating, not only in scientific and thorough manipulation, but in their general qualifications, before we can expect that implicit confidence on the part of the public so ardently desired.

Before the establishment of Dental Colleges there was some excuse for that profundity of professional ignorance which was its principal feature, and which, notwithstanding all the light we have, still characterises, to a lamentable degree, the great mass of those engaged in dentistry at the present time. With no less than five Dental Schools in the country, all having able corps of Professors, with other requisites for thorough teaching, no man can reasonably complain of the want of facilities for a professional education, of which neither himself, nor the public for him, need be ashamed, and which, if secured, early or late, will do more to educate the people in all that is essential for them to know about their teeth, than will be accomplished by publishing popular essays, &c., to the end of time.

I do not particularly object to the publication of essays or newspaper articles on dental subjects, nor to teaching or explaining at the chair, for doubtless some good has thus been accomplished.

The dentist must almost daily give a reason to his patient for that which he does, or proposes to do, not only as a matter of right, but as a means of inspiring confidence in himself, whether his theories are correct or otherwise; and so far as anything is learned by either party in such cases, the custom is a laudable one.

Admitting the premises, where are we to begin, and what is to be done?

Begin by learning ourselves what we recommend to others. Begin by executing a determination to improve our knowledge of principles, of theories and facts, and by striving to excel in operative skill, based upon such principles, theories and facts. I submit that the good work is already begun, as manifested in the high state of excellence to which, in advance of all former anticipations, many dental operators of the present day have arrived.

Theories now outstrip manipulation, and stand as beacon lights in the path of increasing manual dexterity,—formerly art preceded science, and left her handmaid, cunning, to search out a plausible wherefore. What is to be done is a question of more complex solution.

It has been said that doubtful things are very uncertain, but the assertion, logical as it may appear, still lacks confirmation. For instance, it is doubtful whether well informed and regular dentists, as well as physicians, will ever cease to style as *Doctor* the pestilent apes who crowd the purlieus of the profession in both town and city; yet there is no uncertainty that the practice is pernicious, in so far as a kind of endorsement is thereby given, and the public, to some extent, educated to believe that every man calling himself a dentist is one. Outside the Dental Colleges dentists themselves make no distinctions, have no standard of qualifications, and consequently have no right to complain of the public for a want of discrimination superior to our own.

If feasible, I would have provision made by our Dental Schools for the examination, without the lectures, of any man in the profession who has not already graduated, that he may, if found competent, obtain proper testimonials of his fitness to practice, otherwise let him study more, retire from the profession, or be regarded as an empiric. Let it be generally understood by aspirants to our ranks, that nothing short of entire fitness will insure them the least countenance, and they will hesitate before placing themselves in a position to be regarded by the profession and by the public as acknowledged quacks. Let it be understood further, that no respectable practitioner will have anything to do with foisting an illiterate and reckless villain upon the public as a dentist, and such characters will seek channels of employment more in consonance with their qualifications, and the people will learn to respect and encourage the worthy.

In this way, and in exerting ourselves individually, to further and continued improvement, we shall gradually, but surely, elevate the profession to that point where the exercise of its duties will cease to be regarded as an experiment. In a word, when the dental profession shall come up to the work of self-regeneration, and so teaches, by example, in all that insures public confidence, then will popular dental education have at least begun.

REVIEW OF RESEARCHES ON THE MEDICINAL PROPERTIES AND APPLICATIONS OF NITROUS OXIDE.

The author of the above work, George J. Zeigler, M. D., is well known to the readers of dental and medical literature as the author of several well written communications on the above subject. His work, which has recently been published, it would seem, embodies his previous papers, and presents his researches in a more extended manner. While many who peruse the work will be apt to assert that the author is an "enthusiast," and extols too highly the medical properties and applications of protoxide of nitrogen, still we consider it well worthy of careful study by all who make any use of nitrous oxide, and particularly those who are in the habit of exhibiting it to induce anæsthesia for dental or surgical operations. The chemical constitution, properties and correlations of nitrous oxide are first considered. On the reciprocal relation existing between this agent and atmospheric air he says: "In composition nitrous oxide differs from all other chemical bodies, although identical in constitution in the main with atmospheric air, varying therefrom, however, both in the proportion of its constituent elements, and in the character of their association. Thus, while nitrous oxide contains about one-third of oxygen to two-thirds of nitrogen, atmospheric air has only about one-fifth of the former to four-fifths of the latter. Moreover, in nitrous oxide, the respective elements, nitrogen and oxygen, are in chemical combination with each other; whereas, in atmospheric air, they are in but simple mechanical association, without any apparent chemical union whatever. Nevertheless, though thus differing in the relative proportion and character of association of these constitutional elements, protoxide of nitrogen and atmospheric air are similar in their general properties and relations, varying more in the degree, perhaps, than in the nature of their affinitive reactions and physiological effects."

The correlation with oxygen is adverted to; the similitude being especially manifested "in the chemical and vital reactions, for, like atmospheric air and oxygen, protoxide of nitrogen is an active supporter of combustion and of life, though in these respects it is in some measure more nearly allied to the latter than the former, from the greater relative proportion of this important element, as well as in consequence, doubtless, of the peculiar combination of its constituents." The physiological influences are next considered, and the opinion is advanced that it exerts an energetic and decidedly stimulant action upon the animal economy, yet, in most cases, being so entirely distinct in its action "from all other excitants as to be quite unique." The effects on the human system claim attention, and he says: "The primary stage of sur-excitation, with its concomitants, anæsthesia and trance, is usually, however, of brief duration, terminating rather suddenly, yet leaving generally a sense of permanent invigoration, similar to that resulting from a free exposure to fresh atmospheric air, not being followed with any reactive languor or depression, so common with ordinary stimulants." The author's experience—which is an extended one—differs considerably from my own limited observations and from others, whose opportunities for testing the after effects of nitrous oxide have been confined to actual demonstration. These assert that a reactive languor or slight depression is rather the rule when anæsthesia is induced, though there are many exceptions, and these exceptions may be seen not unfrequently where sulphuric ether is administered, as we have witnessed in numberless instances. Of the *hygienic uses* of protoxide of nitrogen he says: "In brief, then, through its constituent elements and dynamic properties, nitrous oxide exerts a powerful influence in both supplying essential matter for organization, and in promoting the general molecular cell, nutrient, reproductive and dynamic operations of the animal, those of the vegetable, animal and psychical life inclusive. It is thus, indeed, remarkably active and potent in promoting the various functions of digestion, absorption, circulation—both general and capillary—æration or arterialization, hæmatosis, calorification, assimilation, disintegration, depuration, secretion, excretion, muscular and general contractility, innervation and intellection; and likewise those of the reproductive system. Hence, for the preservation of the healthy integrity of the body, and the regulation as well as invigoration of all the important functions of life, this agent may, *cæteris paribus*, be always employed with advantage."

Of its value as a *therapeutic* agent he remarks: "Its practical application, for the removal as well as the prevention of disease, are numerous and diversified. In fact, in these respects, the protoxide of nitrogen is not surpassed, if equalled, by any known sanitive agent outside of those included in the materia alimentaria." "Nitrous oxide is thus unique in its physiological and sanitive influences as well as in its chemical constitution and properties; for, though analogous in the extent and variety of its therapeutic uses to some of the most active medicinal substances, such as iron, quassia, strychnia, quinia, mercury, etc., it is far superior to them in the greater range and diversity of remedial application, as well as in the general character and special peculiarities of its effects upon the animal organism. Indeed, from my present knowledge upon the subject, I am convinced that protoxide of nitrogen will supersede, to a considerable extent, some of our most reliable and popular remedies, while at the same time it will render the prevention and resolution of many of the ordinary forms of disease more certain, speedy and decided; and, moreover, afford the means of removing some of those peculiar abnormities now not at all, or but slightly amenable to the present therapeutic measures." The author continues on the subject of the medicinal properties and applications of protoxide of nitrogen, and presents his views as to the usefulness and indications for the administration of nitrous oxide in some *forty-five* different pathological conditions incident to the human economy. Nitrous oxide, as an anæsthetic, claims from the author considerable attention, and while he directs attention to its appropriate uses, he does not neglect to show the general characters of the dangers to be apprehended from the undue or injudicious administration of nitrous oxide. Thus, "the free or inappropriate use may produce both primary and secondary irritation, congestion, serous or hæmorrhagic effusion, and inflammation in different parts of the body, and especially in the brain and kidneys,"—or, "by overstimulation or superoxidation, cause excessive disintegration and undue waste, as well as abnormal excitement of the system, even to destructive softening of the brain, nervous tissue and other important structures. Furthermore, by unduly accelerating functional action it may give rise to rupture of the heart and bloodvessels, or disruption and other mechanical derangements of important parts of the organism. Moreover, through its powerful aphrodisiac effects, it may intensify sexual desire to such a degree as to cause unpleasant exposure or even serious trouble. It is probable, also, that dangerous intoxication might sometimes ensue from the chemical reactions of the elements of protoxide of nitrogen with those of the body, and the consequent formation in excess of such compounds as carbonic acid, cyanogen, ammonia, urea and other substances of the kind." The preparation and combinations, modes of administration and dose of nitrous oxide, are considered at length, and we close this review with this expression of our judgment, that while the author has presented many views that are new, and some has urged claims for nitrous oxide which time and experience may decide it is not entitled to, yet these views are worthy of consideration, and all who are interested in this subject should possess this little work. It is published by Messrs. J. B. Lippincott & Co., Philadelphia, which is equivalent to stating that the general typography of the work is excellent. G. T. B.

CAUSES WHICH HASTEN OR RETARD VULCANIZATION.

BY GEO. E. HAYES.

In an article entitled "Temperature and Pressure in Vulcanizing," by A. Lawrence, in the July number of the TIMES, after alluding to experiments with an imperfect thermometer, the following sentence occurs: "I make no comments here, further than to suggest that some of our short-time friends have probably got just such a thermometer, and can, of course, save time at the risk of charred work and of having their heads blown off." In this sentence the doctor assumes, that temperature and pressure of the steam within the vulcanizer, are the sole causes of hastening or retarding the process. This I regard as an error. When I first commenced vulcanizing, it was with just such an instrument as he uses, one of Warren's, the size of a small bee-hive. The time required was two and one-half hours at 320°. There was leakage at all the joints; and the machine had so formidable and dangerous an appearance, that it led, finally, to the construction of an oven; the object then being mainly to reduce the size, in order to secure greater safety with the same thickness of metal. Its capacity was barely sufficient to contain one flask. I mention this, because the history of this little instrument will throw light on the question at issue. In experiments with this machine, the thermometer was known to be correct. At the first trial it was kept at 320° two hours. The rubber came out nearly charred. It was tried again at 320°, one and a half hours; still very dark. Then one hour; too dark yet. Then forty minutes; this seemed about right. The rubber was hard, light-colored, tough and elastic. My surprise was great at such a result, and I at first supposed it due to the diminutive size of the machine. In this I was undeceived in the following manner: The mechanic who made the oven suggested that he could get up a better looking machine, at less expense. He accordingly made arrangements to cast them in brass. The first one finished was put to the test, heat up to 320°, and kept there forty minutes, the same thermometer being used as before. The rubber came out perfectly soft. Tried again with no better result. Next time kept it heated up one and a half hours; had just begun to harden. This was a new mystery. The thermometer was examined and found all right.

I could not give it up. The next night it was again heated up, and, while seeing if the joints were perfect, a tool was accidentally laid upon the surface of the turned brass and was instantly bedewed with moisture. On examination it was found that steam was escaping from the whole surface, and while it did not prevent the temperature from rising to 320°, it did, undoubtedly, and effectually, prevent that degree of heat *penetrating* to the centre of the flask. It revealed the fact that a vulcanizer, to be reliable, and uniform in its results, must be absolutely steam-tight. This will show the doctor why his "brother, in Philadelphia, finds it necessary to vulcanize at 335° to 340°, while the same thing is done in some other, or even the same place, at 300° to 320°, and in about half the time," without involving "a lack of uniformity in the graduation of our thermometers," either with or without design. From that moment all my experiments were directed towards cutting off every chance for leakage. The safety valve was discarded. The thermometer, which, up to this time, had been placed within the steam chamber, was adjusted outside, so as to receive the heat from a mercury bath, situated upon or within the substance of the cover, thus confining all chance for escape of steam to the packing joint. When this joint was secure the rubber always came out hard. When escape of steam could be detected, it was invariably found soft, unless subjected to heat a much longer time. On one occasion a screw joint, similar to the Whitney machine, was tried, and forced together with a wrench 18 inches long. The joint was not sufficiently tight to vulcanize in forty minutes. The wrench was then lengthened to three feet, and the whole power of a man was exerted. Vulcanization then took place in that time, but, on opening the machine, the packing was torn to shreds. The plan finally adopted, enabled these machines to vulcanize in much less than half the time required with the Warren and Bank's machines, at the same temperature, and under the same pressure per square inch. Instead of forty minutes at 320°, as I then supposed was requisite, I now find that from fifteen to twenty minutes exposure to a heat of 320° is quite sufficient, providing the heat has been raised not faster than 3° or 4° a minute, and this with such perfect uniformity, that every piece may be obtained of precisely the same quality. This cannot be done with any machine which leaks steam, sometimes more, sometimes less, as the time required, other things being equal, depends on the amount of leakage. Some have supposed that the thermometer not entering the steam chamber made a difference, and that the heat inside was really greater than indicated. This objection was raised by the examiner, when a patent was pending, and was referred by him to Prof. Hadley, of this city, who, after a patient examination, submitted the following certificate:

"I have compared the indications of two thermometers in the Vulcanizing vessel invented by Geo. E. Hayes, one having its bulb in the steam chamber, and the other having its bulb immersed in a small cavity filled with mercury made in the wall of the vessel. On heating up the vulcanizing vessel with the plaster mould inside, the two thermometers rose together, attained the same height, (325° F.,) and fell together, with a correspondence very exact, and at no time during the whole experiment did the variation exceed one or two degrees Fahr." The trial was repeated with precisely the same result. The thermometers were first verified by immersing their bulbs in the same vessel of mercury, and heating to above 320° F. They were found to correspond exactly.

BUFFALO, N. Y., January 11, 1861. GEORGE HADLEY.

One other advantage was gained by this adjustment, which had not then been thought of, and which has a direct bearing on the subject discussed in the article above referred to. It had been found that a glass thermometer, exposed to the pressure of steam, was not very trustworthy, but why it was not so, does not appear to have elicited much inquiry. My attention was called to this subject by the great quantity of tubes called for to replace defective ones when used within the steam chamber, as compared with those wanted for a like purpose in machines where the bulb was not exposed to pressure. On examining such tubes, it was found invariably that the glass bulb was checked into numerous fragments, like a piece of mosaic, each one retaining its place, and securing a certain amount of play to the mercurial column, but ready at any moment to fall to pieces on the slightest concussion, and, doubtless, becoming more and more incorrect every time the instrument is subjected to pressure. This could hardly be otherwise. The wonder is that this thin bulb of glass can withstand a crushing pressure of 80 pounds to the square inch, even for a single heat. The tubes used in the mercurial chamber present no such appearance. They are subject to breakage from concussion, or other external violence, but while the column remains intact, their indications may be relied on with as much certainty as when used for any other purpose. There is no gradual deterioration. If an accident happens, it shows itself at once, even to an inexperienced eye, and the dentist is not beguiled into placing reliance on a faithless monitor. In vulcanizing, the object is to ascertain the precise amount of heat. The steam gauge will do this by showing the amount of pressure inside of the vessel. The thermometer shows it directly, by measuring the expansion of mercury within the tube. That is best which is most simple, and in which an error is most easily detected. With the gauge, all depends upon the nice adjustment of springs by mechanical means. May not these springs, and this machinery, be subject to deterioration from heat and frost, from pressure and relaxation, from rust and corrosion, and from other effects of use and time, and who shall tell us when such deterioration has taken place? Must we call in the inspector annually or oftener, to solve our doubts? If I mistake not, this is deemed necessary, and even required by law in some places, for those who use the gauge in connection with the steam engine. Very likely the gauge, under certain circumstances, may prove the preferable instrument of the two, but before raising a prejudice against an instrument in so general use as the thermometer, it seemed to me no more then even justice, first to point out the causes which have led to failure, and then the proper mode of using it in connection with the vulcanizer.

DISEASES OF THE MAXILLARY SINUS.

BY GEO. T. BARKER, D. D. S.

(CONTINUED FROM PAGE 14, VOL. III.)

Ulceration of the lining membrane of the maxillary sinus is occasionally met with, but is not of so frequent occurrence as the other conditions previously adverted to in former communications. Most pathologists treat of it as merely a symptom of some other morbid condition, but, nevertheless, it seems to me appropriate that it should receive special mention, particularly as it may result from a simple mechanical injury, local irritation from dead or diseased teeth, or roots, the resulting inflammation having passed on to the ulcerative stage. In all instances of this affection, there is first a modification of the normal secretion of the cavity, followed by the formation of an ulcer or ulcers on the floor of the sinus. These extend, sometimes coalesce, until, occasionally, the whole lining membrane is affected, besides, in many instances, passing outwards and affecting the mucous membrane of neighboring structures. When treating of the inflammation of the sinus in a former communication, I stated that persons of scrofulous or syphilitic habit were more prone to affections of this nature, in consequence of the depraved condition of the blood, nutrition being imperfectly performed; the same remark may be appropriately made of the condition under consideration, indeed, it depends for its development upon the depraved habit of the affected person. Ulceration of the lining membrane may commence in several distinct ways—first, there may be such a degree of active inflammation in the part as to cause molecular death; secondly, inflammation of a chronic character may give rise to ulcerative inflammation by modifying the nutritive actions, the healthy balance between composition and decomposition not being maintained; or, as seen particularly in specific cases, the ulceration being preceded by certain morbid growths, which inflame, disintegrate—consequent lesion of substance occurring. There are several varieties of ulcer met with; the simple, fungous, scorbutic, venereal, cancerous, scrofulous, phagadenic, &c. The symptoms of this abnormal condition do not differ very considerably from those of inflammation of the sinus, treated of in a former arlicle. There is present a dull and continuous pain, sense of weight and heat, an escape of a fluid into the nostrils or mouth through the nasal opening, or it may be through an artificial or fistulous cavity. This fluid is of greater consistency than that seen in inflammation of the sinus, which is due to the disintegration and ejectment of the disorganized tissue or its constituents, the "slough," as it is termed, being united with the abnormal secretion of the lining membrane. It is also exceedingly fœtid, and highly irritative, which is very annoying to the patient. In the malignant forms of ulcerative inflammation of this cavity, the discharge is of a dirty yellowish green, or brownish color, or is mixed, more or less, with blood and pus. It is whitish yellow in the simple ulcerations. In consequence of the presence of this disintegrated tissue, or flocculi, in the secretion, the natural opening into the naries is apt to become closed, the fluid would then, by its presence, act upon the bony wall, increase the pain and discomfort, and eventually, if not evacuated artificially, would cause absorption and disintegration, until it effected an escape through the walls of the sinus. If ulceration continues for a length of time, caries, or necrosis of the osseous walls, will ensue, the teeth will become loose in their sockets, preceded by absorption of the alveolar process, accompanied by inflammation and ulceration of the gum tissue and surrounding soft parts. As the disease advances, there is a tendency to asthenic and irritative fever, which subsides in many cases only upon the dissolution of the sufferer. As previously remarked, one of the best diagnostic signs of this condition, is the depraved state of health of the affected person, for while, undoubtedly, a necrosed root or fang may induce ulceration of the sinus, it would not be likely so to do unless there was a strong predisposition to a low degree of inflammation.

Another, and one most frequently met with in those inflammations that are known as specific, as scrofulas, or syphilis, is a peculiar cadaverous expression of countenance, and more or less induration of lymphatic glands in the neighborhood; but as I shall refer to these abnormal conditions more particularly when treating of morbid growths in this cavity, I will proceed to direct attention to the appropriate treatment of ulceration of the lining membrane.

As in *all* conditions of the sinus, where a fluid is inclosed having no outlet, the first indication is to evacuate the contents and thoroughly cleanse the cavity, at first with tepid water, a small quantity of table salt being added to overcome the fœtid condition of the discharge. The next is to search for local irritants, as dead or diseased teeth or roots, remove them without delay, and until an examination, thorough in its character, has been made, no treatment should be attempted. Appropriate stimulant injections for the lining membrane should now be used, and these may be either of the vegetable or mineral astringents. I have found tannic acid, diluted with water, two or three grains of the former to an ounce of the latter, to be efficient. Dilute solutions of acetate of lead and sulphate of zinc are also useful. Harris remarks, "if the ulcer is of an irritable nature, warm injections, thrown into the antrum by means of a properly constructed syringe, of decoction of poppy heads, chamomile flowers, or the leaves of hemlock, will often prove beneficial in soothing the pain. Tincture of myrrh diluted, or a decoction of walnut leaves, may be advantageously employed as injections in cases of indolent ulcers." My attention, some years since, was directed by Prof. E. Parrish, of the Philadelphia College of Pharmacy, to the peculiar healing influence of honey on the mucous membrane; acting upon the suggestion, I have used, with marked success, strained honey diluted, in all cases of inflammation and ulceration of mucous surfaces. In a case of ulceration of the lining membrane, which was under treatment, it was very beneficial, but, unfortunately, the person was of a scrofulous diathesis, and the disease had existed for a considerable length of time and could not be entirely eradicated. General treatment will also be necessary; if the person is debilitated, the mineral or vegetable tonics, as the preparations of iron, or arsenic, or quinine will be demanded. The diet must be regulated, and should be of the most nutritious character, and every effort should be made to improve the quality and quantity of the blood; once having succeeded in accomplishing this, ulceration of the lining membrane is readily overcome, as the granulations, which heretofore were thrown out, became partially organized, and were subsequently disintegrated and ejected, now will become organized by the elimination of healthy granulations, and perfect cicatrization will ensue.

[TO BE CONTINUED.]

MR. EDITOR :—An important, critical, and in some respects remarkable, case came into my hands a few days ago. Thinking the circumstances attending it might prove interesting, and, very probably, advantageous to some of our recent graduates, I take pleasure in communicating them.

In December last, a gentleman of this city, Mr. Robt. Walmsley, about thirty-five (35) years of age, called to ascertain the cause of pain and swelling at the angle of the jaw. Upon examination with an instrument, for it was invisible, I found a dens sapientiæ lying prone upon the gum, covered by the integuments in that region, the masticating surface squarely against the second molar. I presume the tooth had, by this time, attained its full size, as some slight cutting of the gum and surrounding tissue afforded relief, and it thus continued until a short time back, when it again became irritating, which, together with the annoyance from decomposition of deposits under the tissues overlying the tooth, induced him to have it removed. Last Wednesday evening, the 20th inst., he came to me for that purpose; the only part of the tooth yet visible was the lateral portion of a cusp, in extent about a square line, (an exact illustration of the case may be seen in "Tomes' Dental Surgery," page 235, figure 75.) I slowly and carefully secured a proper hold of the tooth with ordinary lower wisdom forceps, after finding the crown too much depressed to use the "physic" forceps; a few movements sufficed to loosen the tooth. But now comes the difficulty and singularity of the case; it was like a kernel in a cracked nut, which, although loose, will not come out without a further breaking of one or the other; of course I determined to avoid sacrificing the second molar, if possible. Three fangs of the tooth were converged and united in a round smooth surface, which would move in the socket as the crown would be raised to clear the molar, while the fourth fang was prolonged one-fourth of an inch, curved and projecting through the alveolus towards the ramus. The first movement to elevate the crown sent this prolonged fang against the inferior dental nerve, probably about where it enters the canal, resulting in complete temporary paralysis of that side of the lower jaw, an insensibility and apparent absence of all the inferior teeth on that side, just up to the mesial line, and in the cheek and chin just to the symphysis, *one half* the tongue was also almost insensible. The shock was excessive, and the pain, although momentary, was excruciating; ten or fifteen minutes would elapse before any sensibility would return to the benumbed parts. Twice this occurred. The muscular force employed was exceedingly small, being very slow and careful in my manipulations, but the instant the crown of the tooth was lifted to a certain point the shock would be felt, which he said was as though a tremendous blow from a club had been dealt him on the jaw. The third time I removed it, using a little more, and sudden force; same effect on the nerve. Only partial sensibility has yet returned to the paralysed parts, and in the chin and right side of lower lip, where the nerve filaments are most numerous and terminate, total insensibility still exists; his condition, however, is daily improving.

I will now speak of the danger which attended this operation. Before the patient left my office, the bleeding, which was in amount about equal to an ordinary case of single extraction, had entirely ceased. At 10 P. M., I was sent for. I found him bleeding considerably and a good deal of pain at the angle of the jaw; applied a strong solution of tannic acid without any effect, then sol. per sulph. iron with a like result, the bleeding increasing to profuse hemorrhage. The blood was not in a depraved condition, but good rich blood, coagulating readily and freely. I then applied sulph. copper and compress, at which time, 12 o'clock, the patient had lost nearly four pints of blood, from which loss he now fainted. The copper somewhat checked the flow, but not satisfactorily; in his critical state I was afraid to rely upon it. I then introduced a stick of nitrate of silver, thoroughly cauterizing the bottom and sides of the socket. This stopped the flow almost instantly. The patient was now returned to consciousness, very weak, but not too prostrated to rally and recover; twenty-four hours after he was able to get up, and to-day he is about, gradually, but surely, approaching recovery. Had the bleeding continued one hour longer, he, to-day, would have been a dead man. OCCIDENTAL.

BROOKLYN, September 24, 1865.

ON THE UNIFORMITY OF DENTAL FEES.

BY J. Q. B.

It is about time that some action, and that final, was taken by the Dental Profession in regard to their remunerative fees for services rendered the public. Much valuable time has been expended in arguing and debating different subjects appertaining to the advancement of dentistry, but the main feature of all, remuneration, seems to have been overlooked, and a regulation, or system of prices, forgotten. All dentists are aware of the many difficulties attending that portion of our practice, in fact, not knowing, in many cases, what to charge for our labor. There being such a multiplicity of fees for every particular in the business, and every dentist charging that which he thinks a remuneration for his services, some valuing at an exorbitant figure, others more moderate, and some placing no valuation whatever upon them. By such proceedings, the public may well exclaim, "that dentistry has no conscience," being entirely governed by the station in life, or circumstances of their patients, and thereby regulating their fees accordingly. The Medical Faculty have for years been governed by a schedule, or regulation of prices, consequently all doctors agreed, at least on *one subject*, and why not the Dental Profession? I merely wish to call the attention of the dentists to this fact, and see if by some means it cannot be obviated. Time will not permit me to enter into the many annoyances to which the dentist is daily called upon to bear, and space cannot be afforded for the experience and trials, to which we can all testify, for the want of some uniformity in dental fees.

Now, our Dental Colleges have done much towards elevating the profession, and as dentistry is recognized as a science, let us have, through the colleges, a standard list of dental fees, a copy of which to be placed in a conspicuous position in every dentist's office, so that the public may have an opportunity of seeing, and knowing, that there is an uniformity of prices. Those that see fit may follow them, or charge exorbitant prices, moderate or nothing, as their fancy dictates. But the public will be the gainer, and thereby learn to discriminate, and relieve the dentists of so much unnecessary trouble and anxiety.

SENSIBILITY OF DENTINE.

BY JAMES TRUMAN, D. D. S.

(Read before the Pennsylvania Association of Dental Surgeons.)

Dentine, regarded as a whole, may be considered as a mass of tubes, laid with a certain degree of regularity in juxtaposition. They have distinct parieties, and are, in a certain sense, independent of the surrounding intercellular tissue. They possess but one open extremity in connection with the pulp. The peripheral ends are lost at the junction of cement and dentine, or pass over and disappear in the former tissue. In the coronal portion numerous branches are distributed at the enamel, or they pass over into the latter tissue and either become too minute for observation, or terminate abruptly with an enlarged diameter. It is at this part of the tooth that extreme sensibility exists. It was very early discovered in operations upon the teeth, that in making excavations upon the broken down tissue of carious teeth, that the pain was most acute at this point. Theorizing upon this fact, many entertained the idea that these tubes must of necessity contain a nervous structure, but the evidence to support the theory was wanting. Not until recent years has any attempt been made to demonstrate the cause of this sensibility, or, if made, was unproductive of results.

But little difficulty has existed in determining the character of dentinal tubules, as far as their general form is concerned, nor has it been difficult to demonstrate their tubular structure and that they are filled for the conveyance of nutrient fluid to all parts of the tooth; but, as examinations have generally been made upon dried specimens, it has not been possible to determine whether or not these tubes were traversed by a nerve tissue. That they contained matter, of greater density than fluid, has long been considered settled, but of what that consisted the best authorities were unable to determine.

Owen,* writing in 1845, says: "that some elementary prolongations of nerve may be continued into these tubes, who may confidently deny?"

In the experiments instituted by Tomes, of feeding a young pig on madder, the coloring material extended only to the inner tubular tissue. The parieties of the tube, nor the inter-tubular tissue, were not affected. This fact has more recently been taken advantage of by another observer,† to exhibit soft tissues and germinal matter, as he terms it, that may exist in bone or tooth substance. He uses, for this purpose, carmine dissolved in ammonia. This will color all these tissues a deep red, the balance of the tooth retaining its natural color. In sections that I have thus prepared, allowing them to remain several hours in the carmine solution, and then regrinding them with scotch stone until the required thinness for examination was reached, exhibit, very beautifully, the color through the tubules; but, as in the case of the madder experiment, confined entirely to the inner tubular tissue. Reasoning from this fact, we may conclude, that inasmuch as the coloring matter takes effect only upon the soft tissue, that the tubules must be permeated by a tissue to some extent resembling it in structure.

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*Odontography, p. 470.

†Dr. Beale.

Kölliker,* up to 1860, believed the tubules were permeated by fluids solely, and writes upon the sensibility of dentine after this style: "the tactile sensibility of the teeth is also tolerably fine, especially upon the masticating surface, where minute foreign bodies, as hairs, or grains of sand, are distinguishable, where the masticating surfaces are rubbed upon one another, and its intensity is very great in disease, which is sufficiently explained by the large supply of nerves in the pulp, and the facility with which they may become pressed within their hard enclosure. This distinguished observer fails to notice the labors of Dr. Tomes in this direction, although the work, from which the above was quoted, was published sometime subsequent to the announcement of the discovery of the dentinal fibrils by that gentleman.

Although so long a time has elapsed since the discovery was announced that each tube was occupied by a fibril and followed its course, but few histologists have been found willing to recognize their existence. I am at a loss to explain this, in a matter so simple, and one requiring so little skill to elucidate. It may possibly have arisen from want of care in preparing sections to represent them, and also that they are not readily demonstrated in dry teeth. Dr. Beale, in a recent work on the tissues, fully endorses their existence as a fact, and this, from one so eminent in histological matters, should set to rest the number of *second hand* observers who have denied their existence. Much of my time, during the past year, has been devoted to examinations in this particular direction, and, from want of knowledge of the proper mode of manipulating the sections, suffered, in my earlier efforts, a full share of disappointment. In a partially decalcified section of a human tooth, afterwards fractured in a direction transverse to the course of the tubules, these fibres were seen protruding in large quantities, resembling the undergrowth of a forest. In an entirely decalcified section of a partially developed tooth of a lamb, a series of isolated tubes were seen, much broken up, and from these the fibrils could be beautifully observed passing from section to section of the fractured tubes. These fibrils present a tubular aspect, and, very probably, are of that character, and serve for the transmission of fluids for the nutrition of the tooth and of sensation; but, of this, I have not been able to satisfy myself. They appear to be nearly structureless in character. These fibrils cannot be confounded with the tubes, for their appearance is very dissimilar. This must be apparent to any one in an examination of a section in which the tubes have been isolated by decalcification: neither are they shreds of fibrin, as has been supposed to have been proved by a distinguished member of our profession,* but are, in my judgment, simply what Dr. Tomes asserts them to be, nerve fibres, to whose presence in the dentine we owe all the sensibility, both in the cavity of decay and the power to localize touch upon the masticating surfaces of teeth. I do not wish to be understood as denying the possibility of impressions being conveyed to the pulp by vibrations in the fluid that may be contained in the tubules. Such, undoubtedly, would be the result, but that this is the primary cause I do deny. It appears to me that this theory, supported though it be by Kölliker, Robin, Magitot, and others, is wholly irreconcilable with the fact that sensation is experienced at the point of contact with the instrument in cutting on the foreign substance in mastication, and that the greatest amount of sensation is experienced at the junction of enamel and dentine. If the fluid is the conductor, the pain must be felt at a point somewhere in the interior of the tooth. But we all know this is never the case. That the dentinal tubes are solely occupied by fluid I do not consider to have been proved, and, until this is accomplished, it seems to me a waste of time to attribute results to causes, the existence and functions of which is involved in so much obscurity, and, with my present means of observation, must regard all such theories as fallacious. An objection has been urged against the claim of Dr. Tomes, that these fibrils are larger than the tubules from which they appear to emanate. This is only true in exceptional cases, and may be caused by flattening upon the slide. In a large number that I have examined, I have not found them of greater diameter than the inner diameter of the tubes. Another objection has been urged with some apparent force, that sensation is reduced as the diseased portion of the tooth is removed. The tendency of all such tissue, when cut, is to retract. This would withdraw the terminal excised portion of the fibril beyond the reach of the instrument, and enable the operation to proceed without pain. Again, in many cases, excavation may be carried on without suffering to the patient. Without doubt, when this is the case, calcification of the fibril has taken place.

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*Human Microscopic Anatomy, p. 309.

For the information of those desirous of making examinations, it may be well to repeat Dr. Tomes' mode of preparing sections, which I have found the best to bring these fibrils in view. First reduce the tooth sufficiently thin for examination; allow it to remain in hydrochloric acid, much diluted, until all the earthy matter has been dissolved; wash the section, and lay it on a glass slide, well cleansed for the purpose. Then, while one part is held, tear the section in a direction transverse to the course of tubules, and endeavor to accomplish this without any movement of the portion attached to the slide; cover the section with the thin glass used to cover microscopic preparations, giving it slight pressure. This cover is important, as it serves to bring into view all parts of the torn edge. In my earlier attempts I am satisfied I failed, in many instances, by making examinations without it, thus throwing out of focus many of the fibrils. The tooth selected must be one recently extracted. It is, however, not necessary to decalcify a section to see the fibrils. They may be observed, if care is exercised in fracturing a section, without it; but they will necessarily be short, as in the specimen of my preparation first mentioned.

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*Dr. McQuillen. Report of American Dental Association.

My observations upon the sensibility of dentine may be summed up briefly thus:

First. That sensitiveness in dentine bears all the characteristics of nervous sensibility in other parts of the system, and is evidently produced by the same cause.

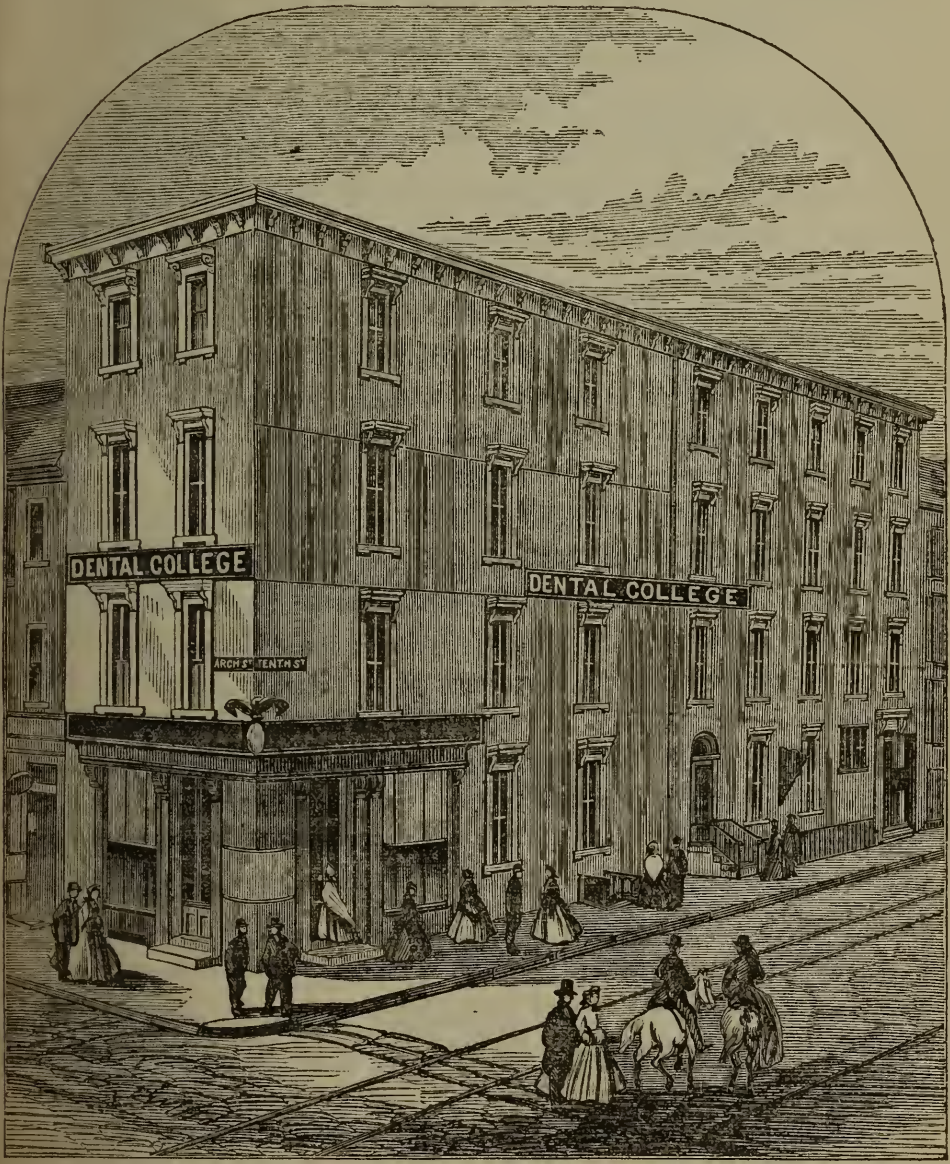
Second. That nerve fibrils ramify through the dentinal tubes, and exhibit their greatest sensibility at their terminal filaments.

Third. That these nerve fibrils convey the sensations to the brain with equal fidelity, though not so acute, in teeth of normal condition, as when diseased.

☞ We publish, in this number, the excellent address of Prof. Brainard, on "SPECIALTIES AND SPECIALISTS IN MEDICINE." It was our intention, at first, to make a synopsis of it, but when we read it over carefully, we found to curtail it in any way would only injure it; so we have published it in full, to the exclusion of other matter that has been lying over for several numbers. We commend the address to the careful attention of the readers of the DENTAL TIMES. It not only shows that the medical profession must soon be divided into several branches—but the doctor also recognizes dentistry as one of them. The dental profession has always claimed to be a branch of the medical, but this is the first time they have extended the hand of fellowship to us. We hope the time is not far off when we will be recognized, not only in the Northwest, but throughout the world. T. L. B.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE TENTH ANNUAL SESSION, 1865-'66.



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The Lectures to the Regular Course will commence on the 1st of November and continue until the 1st of March.

During the last two weeks of October, preliminary Lectures are delivered, one each day.

The Rooms for Operative and Mechanical Dentistry are open from the 1st of October and throughout the session, under the supervision of the Demonstrators.

The Dissecting Room, under the superintendence of the Professor of Anatomy and Physiology, is open during the session.

Fees for the Course, (Demonstrators' Ticket included,) -	**$100**
Matriculation, (paid but once,) - - - -	**5**
Diploma Fee, - - - - - -	**30**

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P. S.—Board may be had at from $3.50 to $6.00 per week.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Tenth Annual Session, 1865-'66.

The tenth annual session of the Pennsylvania College of Dental Surgery will commence on the first of November, and continue until the first of March. Preliminary lectures will, however, be delivered each day during the latter half of the month of October. The Dispensary and Laboratory of the College will also be open from that time, where ample opportunities will be afforded for the prosecution of the practical part of the profession under the daily supervision of the Demonstrators, who are gentlemen of known integrity and thorough capability. During October, as well as the entire session, a clinical lecture will be delivered, and operations performed by one of the Professors every Saturday afternoon.

The course is so arranged that fifteen lectures are delivered each week, on the various branches taught in the school. A synopsis of the manner in which each department is treated will be found under the head of the different chairs.

These lectures occupy about the average time of three hours each day. In addition, four hours are daily spent by the student in actual practice. With this object in view, the operating rooms are furnished with twenty chairs, so arranged as to command the best light, and all the appliances necessary for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate.

Each student is required to provide his own instruments, (except those for extracting,) and to operate with them. He is expected to keep them in perfect order, and for that purpose is provided with a table in which they can be locked up when not in use. As the operations performed a the College are entirely gratuitous, a superabundance of patients invar ably present themselves.

In the mechanical department every process known in the profession, which has any value to the mechanical dentist, is fully taught; and receipts of valuable compounds are freely imparted. All the conveniences are at hand in the Laboratory for the preparation of metals, manufacture of teeth, (single and in blocks,) mounting, etc.; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression to the thorough construction of the denture, and proper adjustment of it in the mouth of the patient.

In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of Dentistry, the celebrated hospitals and clinics of the city constantly enable the student to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Blockley Hospital, in particular, one of the largest eleemosynary establishments in the world, are open to Medical and Dental students, free of charge. The staff of this institution is composed of some of the most eminent physicians and surgeons of Philadelphia.

COURSE OF LECTURES.

CHEMISTRY AND METALLURGY.

The course of instruction from this chair will commence with the consideration of the imponderable substances.

The laws that govern the imponderable bodies will next claim attention, with some notice of symbols or chemical notations. Individual elements, and the compounds resulting from their combinations, will then be considered. Organic chemistry will receive its full share of attention.

The course will be illustrated by diagrams and such experiments as can be performed before the class.

DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

The lectures in this department will embrace the Physiological Anatomy of the teeth, general and microscopical, in addition to a minute and careful description of the various operations performed by the dental practitioner.

The microscope, models and diagrams, will be employed in illustration.

At the Clinic the incumbent of this chair will also demonstrate before the class the various operations described in his course of lectures.

MECHANICAL DENTISTRY.

The instruction from this chair will embrace the entire range of manipulations legitimately connected with the laboratory, arranged in two divisions—Mechanical Dentistry proper, and that to which has been applied the appellation of the Plastic department.

I. *Mechanical dentistry proper* will include everything appertaining to the construction of dental substitutes, passing through the different stages of preparation, from taking the impression, to the completion and proper adjustment of the case in the mouth, conjointly with features, expression of countenance, enunciation, etc. It will likewise embrace the metallurgic treatment of the various metals employed, the preparation of plate and wire, the alloying of gold, together with the *alloys* used, as well as those designated as solders.

II. This division will comprise all that appropriately belongs to the manufacture of porcelain or mineral teeth—single teeth, block-work, continuous gum-work, vulcanite, etc. The materials, their preparation, compounds and uses, will be specially regarded.

All new inventions, modifications, and improvements, in this branch of the art, will in place receive due attention and investigation.

PRINCIPLES OF DENTAL SURGERY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist.

They will also include a careful examination of therapeutic agents and their general application. Their indications in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated, and also the general hygienic rules and principles which come within the province of the practitioner.

ANATOMY AND PHYSIOLOGY.

The instruction in this department will embrace a plain and comprehensive view of the structure and functions of the Human Economy. The valuable anatomical preparations of the incumbent of this chair, (consisting of Papier Mache manikins, models in wood, drawings, wet and dry preparations,) will enable him to fully illustrate his course. With the same object, vivisections on the lower animals will also be employed.

The special relations of this branch to the wants of the dentist will be kept steadily in view, and such descriptions of the natural history, microscopical structure, connections, &c., of the teeth, as their importance demands, will be given.

The great facilities for the study of practical anatomy, to be found in the city of Philadelphia, obviate the necessity of providing a dissecting-

room in the College. For the usual fee of $10, the student can have access to one of several well-ordered and well-supplied dissecting-rooms.

REGULATIONS.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College; five years' practice, inclusive of the term of pupilage, will also be considered equivalent to the first course of lectures. The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done, at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees; and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

TEXT BOOKS AND WORKS OF REFERENCE.

Wilson's, or Leidy's Sharpey & Quains' Anatomy; Carpenter's Physiology, or Dunglison's Human Physiology; United States Dispensatory; Mitchell's Materia Medica; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Pysiological Chemistry; C. J. B. Williams' Principles of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Paget's Surgical Pathology, or other standard works on the subject.

THE

DENTAL TIMES.

VOL. III. PHILADELPHIA, JANUARY, 1866. No. 3.

REMARKS ON DR. LAWRENCE'S SUGGESTIONS, OCTOBER NUMBER DENTAL TIMES.

BY T. D. THOMPSON, D. D. S.

"If feasible, I would have provision made by our dental schools for the examination, without the lectures, of any man in the profession, who has not already graduated, that he may, if found competent, obtain proper testimonials of his fitness to practice."

The above quotation I find in the October number of the DENTAL TIMES, by Dr. Lawrence.

Mr. Editor, I would endorse this suggestion of Dr. Lawrence as being very proper and just. I believe that there are many members of the dental profession who have not received proper testimonials as to fitness, who would, were they subjected to a proper examination, be found worthy of such testimonials, and were they conferred upon them, honor them in every particular, and thereby greatly assist the true interest of the profession.

I have lost heart often on looking around and noticing the growth and out-croppings of dental quackery and empiricism. I have, in noticing the reckless, confidential manner of the "natural" and the three months' manufactured dentist, often felt that the profession was drifting back to primitive times, to charlatans and barber tooth-drawers.

I have of late, however, taken a more hopeful view of the situation of affairs. It appears to me, as a reader of the discussions by the members of the various Dental Associations, that the minds and feelings of dentists are being directed in a right course for the true advancement of our cause. The out-spoken minds at the Dental Conventions, and the subjects and character of these debates, have cheered me much, and given me a more hopeful feeling. As a member of the dental profession, nothing would afford me greater satisfaction than to witness its elevation and consequent usefulness.

I have come to believe, from an observation and experience of twenty years, that the right practice of dentistry is of very great importance to every community. I know that upon the condition of the teeth is based much, *very* much, of good or bad health, and am of the opinion of Prof. Brainard, of Chicago, that the right practice of dentistry is an important part or division of the practice of medicine, and that physicians, consulting with properly instructed dentists, would often find it to be of great importance to all interested.

I trust that the suggestions of Dr. Lawrence will find a hearty response among the members of the dental profession, and that it will stimulate many worthy members to make strong efforts for those "proper testimonials."

If my memory serves me, there is, or was, such a provision of the Baltimore College of Dental Surgery. I would suggest, if we are to have a provision of this nature, that it be carefully carried out in a faithful and thorough manner, so that graduates may not have just cause for complaint, and it be not used for mercenary purposes.

INTRODUCTORY TO THE COURSE OF DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

Delivered at the Pennsylvania College of Dental Surgery, November 8th, 1865.

BY JAMES TRUMAN, D. D. S.

(Published by request of the Class.)

GENTLEMEN:—Before entering upon the regular course of subjects, that it will be my pleasure to lay before you, it seems to me important that I should take a cursory view of the duties you will be expected to perform, as far as this chair is concerned. It will embrace the course which it will be best for you, who are just entering upon your studies, to pursue in the clinic, that the highest success may be attained, and the duties that I owe to you, as your teacher, and a general survey of those subjects to which I expect to call your attention.

To begin right, is of primary importance at the outset of life's career. To plan for the future and plan correctly is equally important, though that future may never be yours to enjoy. It is expected, when a student matriculates in this college or any other, that he does so, feeling that having something to learn, he can accomplish that desirable object better here than elsewhere. Hence, I would impress upon you the necessity, on entering these walls, to lay aside all former prejudices that may have been instilled into the mind, and come with a clear feeling that you know nothing. This I hold to be essential in all branches of learning, but it is especially true in our profession. Many, perhaps most of you, have been taught, more or less, of the primary principles of dental science, under your preceptors. This is well, but it is apt to prejudice the mind in favor of certain modes of procedure, and the student, if perchance he finds different ones adopted, mentally resolves that he knows a better way, and feels an unwillingness to accept or even try the new. What is the consequence? Time is short, and, perhaps, when the session is half over, he becomes convinced of his error, but too late to reap the full advantage of the knowledge. This, gentlemen, is no fancy sketch, but true to observations made whilst in charge of the clinic of this institution. So much have I been impressed with this fact, that had I no other reason, I should have felt it my duty to preface my introductory lecture with this warning.

In no profession is the bigot more out of place than in ours. I, as well as you, must keep our minds ever open to the reception of new truths, or we come to a stand; and to *stand* is virtually to *recede*. It has been my observation, that those who have come here, dropping all pretensions to knowledge, even though they may have had years of private practice, and have entered with all the earnestness of first course students, have graduated covered with honor. Whilst on the other hand, I have seen those having had, perhaps, more advantage in previous practice, who knew everything, and could be taught nothing, only escaped being sent away disgraced. This not from any prejudice on the part of their teachers, but simply from the fact that knowledge is always humble, ignorance pretentious.

Hence, I would say, let your minds be blank, and, if in the future, the principles and practice we teach may not correspond with your more matured judgment and experience, adopt others. You will, at least, have had the benefit of the labor of those who have devoted their time and talents to the elucidation of what they conceive to be correct principles. By contrasting the teachings of different minds, you are better able to do your own thinking, and still further carry on the progressive development of new ideas.

We are all learners, gentlemen, and although I am here behind this desk in the capacity of teacher, I am but as a student with you, traveling forward, and aspiring to greater knowledge and perfection in that which has been adopted. We may be compared to many travelers over the same road, some have yet to accomplish their first mile, others have traveled many; but, while all are earnestly pressing forward for the same goal, none have or ever will reach the end—*perfection.*

Hence all pretensions to superiority, are to my mind, out of place. I claim none for myself, save in that which comes from enlarged opportunities and experience. If the unceasing changes which time evolves, have thrown me in the advance, it is a duty I at least owe to those who may require the knowledge, to point out the way that has been taken. But it still remains with you a free choice, whether you will follow or not.

There is no such thing, gentlemen, as genius as it is generally understood. When some noted man steps out from behind the curtain of life and makes his mark upon his generation, the world excuses its shortcomings, by loudly proclaiming him a genius. I grant that to become great requires peculiar qualities that form a basis for success, but no man ever acquired distinction in any branch of science or art, who had not been a hard worker in secret. Providence grants no honorary degrees. To be entirely successful, one must have some natural ability, but, if that was to be the beginning and the end, no great results could be attained. Power to grasp the intricacies of any subject only comes by patient study; and practical excellence, in any department, can only be secured by daily, persistent toil. So that, if there be any among you who feel unnerved at the prospect of commencing, let me assure you that the victory is always to the persevering.

Difficulties will be met with, many times you will be disheartened by failures; but, from my experience, one failure is ever worth *two* successes. The elation consequent upon the first success, leads to forgetfulness of many minor details, or it may have been one of those lucky hits that occur so frequently in every-day practice, and cannot be repeated. But, let failure cross your efforts, if you are made of that stern material that bends, but never breaks, you go bravely to work, and intelligently endeavor to solve the cause. The whole subject is conned over, and when the attempt is made to renew the work, you are in a degree, thorough in the knowledge of the whys and wherefores that produce so undesired a result. Do you imagine if I were to ask one of you a question, and he should fail to answer correctly, that *that* question would ever be likely to be forgotten? It is my intention during the course of these lectures to ask you many such, not particularly for the purpose of developing what you know, but to learn wherein *I* have failed to make myself clear. I know, from personal experience, that this questioning is an ordeal the student would gladly dispense with, and to avoid it many are very willing to occupy the back seats "in the sanctuary." This is wrong, because, if the questioning were confined to the front rows, the advantages of the Quiz would be lost, in a great measure, to those who lacked confidence to meet the ordeal.

The lecturer takes no satisfaction in exhibiting the weak points of any one, though in a certain sense *there is some* satisfaction in it, inasmuch as I believe one question wrongly answered, is worth more to the individual, and the class, than a correct one. Do not misunderstand me here; I would not have, nor should I be at all gratified to have, any very great number answered wrongly upon all occasions. That would indicate either gross inattention on the part of the students, or lack of ability to impart knowledge on that of the teacher; I therefore hope, gentlemen, that no one will be so modest as to take a back seat for the reasons enumerated; if they do, I am afraid it will avail but little, as in justice to you, I shall entirely ignore the custom of confining my questions to the two front rows, and shall ask them indiscriminately.

I am here to teach, not to deliver finely pointed essays, but to endeavor, if possible, to inspire those who have come to listen, with a belief that a large portion of the labor devolves upon themselves. Those of you who have not acquired the habit of correct thinking, must learn this by practice. In my judgment there can be no better way to exercise the faculties than in the manner proposed.

You come together to-day, many meeting for the first time. Acquaintance with each other's peculiarities has yet to be made. Strangers, as you are, a natural want of confidence in each other, and yourself, will be felt. The question will doubtless arise in the mind of the young student, if it will ever be possible for him to work, surrounded, as he supposes he is, by men who may know vastly more than he. This timidity will make itself manifest in many ways; but, particularly in that of procrastination. He will put off any effort to commence. He concludes he will not bring or will not purchase his instruments for a few days, at least until he gets better acquainted. This delay is lengthened out, as I have frequently known, until half the course had been passed over—every day the difficulty of beginning growing worse. If there are any that feel thus in this class, I have simply this to say: an enemy met boldly, is an enemy half conquered. Go to work to-morrow, if you have your instruments, if not, procure them in time for the next day's clinic; get your Demonstrator to give you a patient and go bravely to work. It will be with awkwardness at first. Every plunge of the instrument will perhaps hurt you more than the patient, but every hour will add to your confidence, and the time will come when you will laugh at the timidity of the beginning.

Perhaps no one suffered more than your lecturer at the commencement of practice. Although brought up in the profession and destined for it from youth, I could not bring my mind to enter it; and, at one time left it, as I supposed forever, but circumstances sometimes mould men when least expected, and I now stand here to-day to lead you, I trust, to a higher appreciation of the duties you have adopted.

Much of the work we are called upon to perform is unpleasant. Many of the patients are equally so, both as regards their personal habits and nervous irritability. Learn early to mould yourself to the circumstances, and to do this, begin at once by not refusing a patient in the clinic, because he or she may not be as nice looking as the young lady opposite. Always remember this, that it is among the lower classes of society that you will be likely to find those abnormal cases, that possess so much interest for more advanced students.

A student, who will work on none but nice young ladies, will have a hard time of it when in practice; he may be called upon to treat the very reverse. I am aware it is generally more difficult to manage such cases, but your Demonstrator will tell you, and I will endeavor to show you in future lectures, that cases where uncleanliness has been the rule and the tooth brush the exception, require a course of preparatory treatment, and this, of itself, is a valuable lesson, and cannot be too soon learned. It is a great mistake in a student to reason thus: "I did not come here to learn how to clean teeth." If cleaning teeth is a part of your professional duty, and who doubts it, you came for just that purpose. Oh, but say you, any one can do that, I came to learn how to fill. When I tell you that in many cases it will be impossible to fill until cleaning has preceded it, you may possibly feel there is something for you to do in that direction.

The idea, so prevalent, that any one can scale teeth, I must positively dissent from. It requires nice care and judgment to perform well, and I am sorry to say but few students ever acquire it, simply from the fact that they viewed it in a contemptuous light at the beginning. There is nothing, gentlemen, in the whole round of studies that it will do to neglect. So intimately is one operation woven in with, and dependent on others, that he must be skilled in *all*, who would do his work thoroughly. Knowledge is ever progressive, but the first steps must be carefully trodden, before we can boldly stride onward to greater attainments.

I have now brought you through the beginning; are there any other points you should carefully attend to? Yes. First of all, *cleanliness*. Let your hands be clean. Wash them well, where your patients may see you do it. Pare your nails, to the quick, if necessary to get them short enough, for long ones are an abomination.

Times have changed, the dentist is now expected to be *the* gentleman in all respects. Just in proportion as he approximates this standard, will he command that class of patients, who measure a man's abilities very much by the outside appearance. I am aware that this is not always a safe guide, and yet the world is not over wrong in this judgment, as far as our profession is concerned. For he who lacks nicety of detail in surroundings and in person, will most certainly lack in that manipulative excellence, so essential in all our departments. The time has long passed, and I trust never to be revived, when under the old squeaky tin sign of "John Jones, Barber, Leecher, Bleeder and Tooth Extractor," suffering humanity walked in, to endure a repetition of the tortures of the inquisition. The barber has found his specialty, and I am happy to believe that *we* have at last found a landing place, so far in advance, that even he must forget the relationship that once existed between us. Is it not a sad reflection to contemplate the fearful destruction in those days of wholesale tooth pulling? No marvel that our grand-parents were toothless at a very early age, and that the occlusion of nose and chin was considered a necessary feature of advanced years. All this has changed, now our fathers and mothers pass down the valley of the shadow of life, with the contour of the face almost undisturbed, with health improved, and strength, if not equal to youthful vigor, at least not shorn of half its power by badly digested food. The old barber's sign still swings, but he plies his art upon the outside of the face, and not amongst the "pearls of great price."

It will be well to have a second coat, a thin one is preferable. This is necessary in our operations. The large amount of hair dyes, oils, &c., used now a days, will ruin a coat in a very short time, also rendering it unfit for any future patient. It must therefore be of a character that can be washed, and you will find that it will require frequent changing.

Having seated your patient, avoid touching more than is absolutely necessary, but above all never suffer yourself to sprawl upon the individual, as I have repeatedly seen. Make your patient as comfortable as possible, and do the same by yourself. Don't hurry in anything, and imagine because your neighbor, who is in his second course, fills a tooth well in an hour, that you must do the same. This is foolish reasoning.

Speed comes by practice, and the adoption of the best modes. When I use the word practice, I do not mean to be understood as it is generally used. Practice does not make perfect, it only confirms. Perfection or comparative perfection, for there is no such thing as reaching the ultimate of knowledge or practice in this world, comes by patient study of results, and the means used to produce them. It has been this intelligent adoption of means to ends, that has brought our profession out of darkness, into the high noon of excellence, in all departments.

The instruments that you will require are few, to these you can add as occasion demands or fancy dictates. I have reduced them to the minimun number for all. With these any filling can be put in well. It is far better to begin thus, as a larger number of instruments only confuses, while the application of the few soon grows familiar, and any number you may hereafter add are of course no burden to the memory. Many enter college with the idea that a handsome case of finely mounted instruments is essential to success; and are undeceived when they learn that an instrument is valued here, *only* as the *point* gives evidence of excellence. Handles can only be used to please and astonish visitors. It was a remark, often made by the distinguished and lamented Prof. Townsend, that his eyes were at the point of the instrument, and his estimate of its value was in proportion to the perfection of that part.

I would not have you conceive that I ignore entirely the beautiful, even in its minor exhibition in a dental case. The perfection of mechanical workmanship has no warmer or more ardent admirer than myself, but we must never sacrifice the quality of use, to fill our operating rooms with the beautiful in mechanics. My advice would then be, look at the point first, and do not rely upon your unassisted eye, but use a glass, and satisfy yourself that the serrations are clear, well-defined and sharp. The shape of the instrument is important but secondary. The handle a matter of no great moment.

You need, therefore, in addition to the instruments as we have them here, a stone to sharpen them with; the small Arkansas stone, which you will find at the dealers, is the best for this purpose. Wood for wedging, tape to polish with, pine or cotton wood for the same purpose, rubber tubing; the use of which for banding teeth will be shown you hereafter. You had better add to these a small alcohol lamp, the smallest you can procure. This list comprises all that will be absolutely necessary to begin with. The instruments for extracting are furnished by the college. In the use of these be as cleanly as possible. Don't do, as I have repeatedly seen done, take an instrument, all coated with the blood of one patient, and commence extracting the teeth of others. Such practices are exceedingly disgusting. I am aware that at times the rush of patients is so great that the temptation is to carelessness, and want of order. Nothing, however, is ever gained by hurrying or neglecting the niceties of life.

To those who can afford it, it may be advantageous to purchase their own extracting instruments early in the course, and become accustomed to their use; for I can assure you, the skill acquired in extracting is as much dependent on the confidence felt in the instrument used as upon the instrument itself.

We are aware that economy is, with many, a matter of great importance; hence to meet this well known fact, the selection has been made. There can be no objection to a student having any number of instruments he desires; but my advice would be for all to wait until one course has been nearly completed, before purchasing any large number. You will then be able to select with judgment, and not waste money on unserviceable tools.

I trust it is needless for me to say a word on the importance of using all the time in active work. You cannot afford to waste a moment. Think of nothing, and attempt nothing, but the studies and labor you are here to accomplish. The months are short, and the hour will come, only too soon, for you to give a final account of the knowledge you have acquired. Hours, even minutes, are valuable. They are the passing sands in the great hour-glass of life's development. However small, they mark an epoch in the progress made toward the ideal perfection you have doubtless marked out for yourselves.

As it will not be possible for all to have chairs the same afternoon, do not think, on that account, that it is well to absent yourselves from the clinic. When thus disengaged is the time for you to watch the operations of others. More, perhaps, can be gained in this way, than by confining your experience to your own operations. Indeed, I would not advise you to limit your labors to your own patient and chair, if it were possible to do so. Much can be learned by using the eyes wisely, whilst others labor. The generous criticism that follows, and the discussions that ensue, evolve thought; and thought brings out new ideas, that might not otherwise be eliminated.

I have thought it best to call your attention to the Text Books that belong properly to the teachings of this chair. The earliest, of any real value to the student, was Harris' Principles and Practice. This has long been a standard work, and is yet extremely valuable in many of its features, and cannot be readily dispensed with. Its teachings in operative dentistry, are not exactly such as we would give you. I make this remark, not to depreciate the work, but that you may read with discrimination. Taft's Operative Dentistry is valuable as far as it goes. Its general teachings are reliable, and its practical departments are full, and in the main correct. Tomes' Dental Physiology is entirely out of print; unless you can get it second hand, you will not be likely to get it at all. Tomes' Dental Surgery, although much has been omitted that is important to know, yet it covers very much the same ground as his Physiology, and some points he elaborates to far greater extent. I consider this work one of great value. Indeed, I think no dentist can be up to the march of improvement in Dental Physiology, who is not familiar with the writings of Dr. Tomes. That portion devoted to fillings, extracting, &c., is not, in many particulars, up to the standard of the profession in this country.

I have spoken to you of your duties and the obligations they bring with them. What are mine, as teacher and leader, in this pursuit after knowledge? The duty of a teacher, if I understand it, is to so condense, that the researches, by whomsoever made, may be brought down to a practical basis, suited to the comprehension of the most unlearned. The nearest approach that can be made to this, designates the capacity of any one to instruct. All over-loading with words is a detriment. But of more importance and value, than all this, is the faculty of bringing the student to feel that no great gulf divides the two positions. The instructor should be, as much as possible, the companion; willing to give, and equally willing to receive. It is with this feeling that I enter upon the arduous duties I have been selected to perform. There can be none among you who will work harder than your lecturer, or has labored more to bring together a fund of information for your instruction, and, if I have any reward in days and nights of toil, it will be in seeing you aspire to the largest amount of knowledge attainable in our profession, and the collateral sciences.

The borders of our profession are becoming broader every year; and he must be a close student who expects to expand with its continued and rapid growth. In the attainment of this knowledge do not depend too much on books. Make your own investigations. Authorities are valuable as guides, but a dependence upon them cramps the intellect. When you have advanced beyond the childhood of your professional experience, you should, by all means, do your own thinking.

It is of slight consequence should you fall across the path of old ideas and modes of practice. If the heretical opinion has for its basis *stubborn fact*, rest assured, sooner or later, the fogyism of your generation will be obliged to acknowledge its truth. I am well aware the courage to take this independent course in life is possessed by the few. It is a natural desire to live comfortably with all men, to make our path through life as pleasant as possible; in a word to float with the current of *popular* opinion, be that in science, art, religion or politics. No man ever made a lasting mark in either, who was not, in his day, a hissing and a by-word among his fellows. History is full of illustrations upon this point; but it is unnecessary that I should here repeat them. This fact is patent to all the world, yet we all feel prone to indulge in the comfort of sliding along in the old ways, rather than to subject ourselves to the jostlings, sneers, and absolute persecutions, that follow the stepping out from the fashionable modes of thought and action. No man's opinion should rule you as absolute. The avenues of knowledge are free to all. Should you, in the course of your studies, discover a fact capable of proof, plant yourself squarely upon it, and allow no amount of opposition to drive you from your position. "The world still moves," said Gallileo, when forced to recant, and the world will ever continue to move in all departments of life, though you and I may sink into semi-dotage, and imagine all minds ceased thinking, when we did. Hence, while I give you the benefit of the knowledge I possess. I desire that it should be put in the crucible of your own experience, before it is adopted as the best result attainable. Hold *all* that you believe subject to change, when sufficient new facts have been brought forward to justify you in so doing. A departure from this course is a sure lapse into professional bigotry, than which to me, there is nothing more disagreeable. There is a marked difference, understand me, between an emphatic belief in a principle of action, and a persistent unwillingness to hear or acquire the developments of other minds.

During the course of these lectures, emphasis will be laid upon many points of belief and practice, for that which is learned by direct observation inspires faith, and faith leads to positiveness of assertion; but remember that all such declarations are made, subject to modification, if the occasion ever demands.

I shall call your attention, gentlemen, in the ensuing course, first to the teeth of some of the extinct orders of animals, and shall then follow this up by a rapid survey of the teeth of existing orders of fishes and animals. These will, of necessity, be only cursory, for this department of knowledge alone is so full, that more than one course, if entirely occupied, would be required to illustrate the immense varieties presented. Leaving these, I shall take up the human teeth, commencing with the permanent series, and from this, will describe, in order, their tissues, and their development, as understood at the present time. I shall then divide the physiological part of the course, and introduce that portion of operative dentistry that relates to the treatment of caries, filling, &c. I do this that you may have the full benefit of the practical points at the opening of the term. I shall follow this up by calling your attention to the development of teeth, &c., and continue with such other subjects as come appropriately under the care of this chair.

The field is a large one, and one of great interest to you, as it comprises, in the main, most of those practical points, upon which your success in life must in a great measure depend.

Gentlemen, most of you are just opening upon life's career. You look forward with minds full of enthusiasm to a future, in which you will admit no such word as *fail*, and which is all aglow with golden promises, stored in the mythical bank of the castle builder. I would not, if I could, disturb these day dreams of young life. It is well it is so, for alas, too soon we all know, by actual experience, that our castles become thin air as we approach them, and that every mile may be roughly strewn with impediments to rapid progress. I would encourage this feeling, perhaps, because I ever had so little of what the world calls hope, in my own mental constitution. It is pleasant, many times, to see in others, what we are constitutionally deprived of. To me there is nothing so pleasant and attractive, as a joyous young child, dancing with exuberance of delight at an approaching holiday. It is the pure, hopeful enthusiasm, that sees no disaster, and believes in no disappointments. Such spirits ride the storms of life calmly, ever looking in the great beyond for the certain reward that is to come. So I would, if I could, instil into those of you who have not yet reached a quarter of a century of life. The profession you have chosen is one not always studded with brillants; like every other, it has its dark and bright sides, but, if it is entered fearlessly, persistently, and hopefully, there can be but one result, with life and strength preserved, *success*.

To those of you coming from the country for the first time, to a large city, and have not the steadiness which a few more years of experience might give you, I have a word of caution. You mingle with us for a special object, that object can only be attained by constant labor. You have no time for the frivolities of city life. Neither should you allow the many tempters, that will meet you everywhere, to allure you from the path of rectitude, and an earnest application to study. Remember the blessing that followed you openly, or in secret, when you bid the last farewell to father, mother, sisters or brothers, the anxiety of these, that you should return unstained an honor to the family circle. Your reputation is their honor, and the name you carve for yourself may, in the future, be their glory.

Life is too short to be spent in trifling, too great a treasure entrusted to us to be thrown away and wasted. Then, I would ask, is it not better to keep this motto ever present before you? *I build for the future.* It is no trifling matter, gentlemen, to leave home, friends, and the companions of childhood, to spend even a short four months amongst strangers. One who is willing to make thus much of a sacrifice, is worth too much to be lost in the many puddles of city life. Therefore do I repeat, allow no man to draw you from the direct line of duty.

In conclusion, I trust, that the winter we have before us, may close with the feeling that it has been spent pleasantly and profitably. That those of you, who have come from all parts of our beautiful and free land, from the islands of the sea, flooded with the warm breath of tropical life, or from wherever you may have come, you will realize that the sacrifice has not been made in vain, and that, in returning to the old homestead, you may receive the congratulations of the loved ones around the old hearth-stone, of well done, the commencement of life has been fairly begun, may the closing hour be equally as full in works well accomplished.

TREATMENT OF THE ANTRUM.

Read before the Pennsylvania Association of Dental Surgeons.

BY J. D. WHITE, M. D., D. D. S.

Mr. President and Gentlemen:—By request I appear before you, after a lapse of years, to read a short essay; this I do with the greatest of pleasure. I select the above subject, the treatment of the antrum, because it is a kind of, and, indeed, is truly a line which marks the division between dentistry proper and general surgery. It is on this ground that the dentist and surgeon will meet, and from this stand-point be better able to comprehend each other's *specialties* more clearly, perhaps, than any other in the whole round of diseases to which the human subject is liable. Writers on the diseases of the antrum complicate it at once with malignant disease; humors of various kinds, differing from that which concerns the dentist, so that he, the dentist, in attempting to study them, is carried away into the abstruse field of surgical science, which is entirely beyond the range of his specialty. It is no matter how much a dentist knows of disease in general, but it should be made clear where his duties stop, so that there could be no equivocation on the part of any one whether he is occupying his true field of labor or not. By reference to a few cases this point can be made plain.

Case 1. A few years since a neighboring dentist called to see me to ascertain whether I would see a patient for him, who was suffering with his teeth; the three superior molars. I found the gum and the cheek considerably swollen, patient about fifty-five years of age, and instead of the teeth being the cause of the trouble, it was a disease of the jaw which had involved the teeth. The disease was of a fibro-cartilaginous character, and of a malignant type. I told the dentist and the patient that it would be necessary to remove the whole of the superior maxillary, but believed it was too late. The operation of removing the jaw was performed by the late and distinguished Mütter, but the patient died in about six months. If this dentist had been sensible of his proper field of duty, he would have sent the case at once to a surgeon; the patient lost his life, prematurely, by the ignorance and mistaken duty of this dentist. The dentist supposed it was a case of disease of the antrum, complicated with the disease of the teeth.

Case 2. A young man was sent to me, a few weeks since, by a distinguished surgeon of our city, whom he had been treating for some months for ulceration of the membranes of the right nostril, from which there was a fetid discharge; his teeth were all sound, I mean free from decay, but one, the second molar, was somewhat loose; this tooth I extracted. (The tooth is here shown.) It is entirely sound, except that the partition root is diseased from ulceration and necrosis of the floor of the antrum, which was the result of tertiary syphilis. After extracting the tooth, the patient was sent back to his surgeon, as I had no more to do with it than if it had been a case of gout.

These cases are given to show, that had they come into my hands at first, I would have sent them to a surgeon for treatment; the first one to get the jaw removed before it was too late, and the second case to go under systemic treatment, such as only belongs to the surgeon and not to the dentist, although, in both cases, there was disease of the antrum and jaws. The dentist is auxiliary to the surgeon in such cases. It is too much the practice of the dentist, in my opinion, to enlarge the importance of his duties and his profession, by retaining cases of disease of the antrum and the jaws that in no way belong to him, or his sphere of duties, much to the detriment of the patients. I may ask here, then, does the treatment of the antrum even come under the province of the dentist's duties? I answer yes. The citation of a case or two will illustrate.

Case 1. A gentleman, about fifty years of age, called to consult me, in November, 1862, complaining of a fetid discharge from the left nostril and the throat. He had been treated for a long time for ulceration of the throat and posterior naries, without any apparent relief. He fancied he had ulceration of the throat, and as no relief had been obtained by treatment, he feared he had disease of the lungs; the pus trinkling from the posterior naries into the throat, and exciting cough, caused him to discharge pus, which he supposed came from the lungs, and which preyed so much on his mind that his general health was much impaired. I found the left superior second molar dead, and had been for many years, but it had never been a cause of pain. I could detect no disease of the lungs or ulceration of the fauces or throat, and if such had been the case it would not have been fetid, especially that peculiar kind that characterizes disease of the antrum, which is analogous to rotten eggs. There was no soreness along the base of the antrum, no looseness of the dead tooth, but there was some fullness of the canine fossa of the affected side, a little infiltration into the cellular tissue of that side of the face; symptoms which are always present in disease of the antrum, and taken in connection with a fetid discharge from the nostril, are unmistakable signs of the disease of that cavity. This patient had been under many physicians, but no one was willing to believe he had diseased antrum. I extracted the dead tooth, and found that from the anterior buccal root the floor of the antrum was open; upon injecting tepid water through the antrum into the nostril, a great quantity of matter and flocculi were discharged. If I find that simply keeping the parts clean does not, in a short time, ameliorate the symptoms, I use the chloride of zinc, ranging from two to twenty grains, sometimes nitrate of silver, from two to ten grains. The patient was placed on good diet, the orifice from which the tooth was extracted kept open with a tent of cotton, the cavity syringed out twice a day for a short time, then, as the symptoms improved, only once a day, and at last once in two days. The orifice was allowed to contract as the symptoms improved, until the water passed out of the nostril clean and the fetor disappeared. The tent of cotton was left out, the walls of the orifice leading to the antrum touched with nitrate of silver, and the parts healed up finely. The case lasted four months in treatment.

Case 2. The same patient was attacked, in the fall of 1863, with disease of the antrum, of the opposite side, from a dead tooth which was not decayed, but had become dead from some unknown cause. The tooth was drilled, to test its vitality, before extracting; only a fetid discharge from the right nostril, and fullness of the canine fossa of that side, led to the diagnosis. In two months the case was cured by similar treatment to the first case.

Case 3. A lady, about forty years of age, called to consult me, October 4th, 1865, complaining of a fetid discharge from the right nostril, and sometimes from the throat, some pain all over that side of the face, fullness in canine fossa, some tenderness on pressure, and slight redness of that cheek. I found that the first superior molar was dead, and had been for a long time; there was no soreness of the tooth, no sensibility on percussion. I extracted the tooth, but could find no opening to the antrum. I sent the patient home to return in a few days, because some cases of the kind have become sound spontaneously, with nothing more than the removal of the dead tooth. The patient returned on the 10th of the month. I found the floor of the antrum open. I passed a current of tepid water through the antrum into the nostril, disengaging a large amount of pus and flocculi, very fetid. It is not often that pus is found in the cavity of the antrum after a tooth is extracted, especially after a few days; it is only vesicated mucus, similar to that secreted from the Schneiderian membrane of the nostril during a severe catarrh. It is best to test the contents of the cavity by pouring it into a tumbler half full of water; the pus will sink and the mucus float, and strong stimulants should be avoided when pus is not found there. After the first day, I used a weak solution of the chloride of zinc. I saw the patient every day for awhile; when the symptoms improved, every other day, at last every three days, and discharged the patient, cured, November 27th. I use a tent of cotton, passed into the cavity, to prevent the too rapid closure of the socket from which the tooth has been extracted. I am in the habit of letting it close as fast as I see the case is improving, so that when the lining membrane of the antrum has regained its normal character, that the orifice will speedily close, and the case is cured. The more rapidly those cases can be cured up the better, as an antrum is not in a normal state with its floor perforated, and the sooner it can be closed the less liability there is for the establishment of other forms of disease, and as the lining membrane of this cavity is delicate, and liable to many forms of disease, it is unsafe to tamper with it. I might remark here that some surgeons are in the habit of introducing a leaden plug, with a flattened head, to prevent it from being, by accident, forced into the antrum. I do not approve of it in a simple case of *alveolar-antral abscess*. If the case is for protracted treatment of malignant disease it is another matter. I know of a case, and often see it, where a leaden slug has been worn, by the advice of a surgeon, since the 17th of September, 1860, and the case is worse now than when the treatment commenced, and a few weeks since one of the turbinated bones of that side of the naries became dislodged, and on the patient lying down it fell back into his throat; and another case, where the leaden plug was worn for three years, the inner walls of the cavity were much thickened, and the orifice of the floor of the antrum would not heal up. After what has been said it will doubtless be seen that where an antrum is only affected by alveolar-antral abscess, it can be left to the dentist to manage, but where the cavity is involved in consequence of systemic diathesis, or malignant local disease, it is not a part of his profession, but it is here where the intelligent dentist and surgeon will or may often meet to the mutual advantage of each other, as well as the suffering patient.

IRON.

BY T. L. BUCKINGHAM, D. D. S.

[Continued from p. 30.]

The affinity of iron for some of the other elements is so great that it is rarely found in the metallic state. A small vein is said to have been found in Connecticut, but it has attracted little attention. Grains of the metal have also been found mixed with platina in the Ural mountains. But the principal source of the native metal is of meteoric origin; masses of it have been found so pure as to be malleable and widely, although thinly, scattered over the earth's surface; one mass was found in Texas that weighed 1635 pounds, and another in Brazil of 15 tons. These masses are usually not pure, but are alloyed with nickel, cobalt, tin, copper and manganese. The great source from which the metal is obtained is its ores; they are very abundant, and widely distributed over the earth. Some of them are very rich, while others are too poor to be worked. The magnetic ore is a composition of the per and protoxide, and is the natural magnet or loadstone. It was called by Pliny magnes, from the name of the country Magnesia where is was found, and from this we derive the terms magnets and magnetism. The name loadstone, or leadstone, was taken from the two words load or lead, from its property of pointing North and South when freely suspended. This ore is usually very rich, and from it is obtained the best iron. The greater portion of Swedish iron is obtained from this ore.

The specular iron ore, peroxide, is another ore that is worked to obtain the metal. It is found in large quantities and is very nearly as rich as the magnetic. It is sometimes as hard as granite, and then as soft as clay; there are several varieties, but they are nearly all of the same composition. When this ore is powdered it is of a red color, and one of the varieties is called red hematite, from the Greek word haima—blood. Both of these ores, when fused in the inner flame of the blowpipe with borax, give a green glass bead.

Spathic iron, carbonate of iron, is an ore that is extensively worked: it yields a good iron. It is composed of the protoxide of iron and carbonic acid. From these ores nearly all the iron in commerce is obtained. Some of the other ores are sufficiently rich in metal to be worked to a profit, but as they contain sulphur, phosphorus, arsenic or some other element which injure the iron they are not worked for the metal.

Iron pyrites, bisulphuret of iron, is very common and is of great importance in the arts, as it affords the principal parts of the sulphate of iron, green vitriol, or copperas, of commerce, and is also used to obtain sulphuric acid, sulphur and alum. The color of this is yellow, resembling gold, and is often mistaken for it, but they may be easily distinguished from each other by cutting with a knife, or heating in the flame of a blowpipe. The iron pyrites is too hard to be cut with a knife, and when heated gives off sulphur and leaves a black bead, while gold can be cut very readily and melts under the blowpipe.

The other ores of iron, although numerous, are of not much importance in the arts, except the chromic iron, or chromate of iron. This is found in abundance in various parts of the world, and from it is derived chromium and chromic acid, which forms a number of compounds used for painting and dyeing.

To reduce the ores, two processes are adopted. When the ore is very rich and plenty, so that a portion of it can be lost, it may be worked by what is called the *Catalan method* which probably was the way all the iron was obtained in olden times and is still used in some parts of Europe. A portion, of the rich oxide, is laid upon a mass of ignited charcoal in a furnace suitably constructed, a blast of air being forced in near the bottom of the furnace; the oxygen of the air combines with the carbon and forms carbonic acid, which, passing up through the heated charcoal, is deprived of one equivalent of oxygen and becomes carbonic oxide. The carbonic oxide coming in contact with the oxide of iron takes the oxygen from it, which reduces the iron to a metallic state; but as the iron ore always contains quartz and clay, both of which are nearly infusible, unless mixed with some base, a portion of the oxide of iron combines with them and forms a fusible glass, which, falling down with the iron, protects it from the blast of air which would oxidize it if allowed to blow upon it in the heated condition. When a sufficient amount of iron has collected in the bottom of the furnace, it is gathered together and carried to the hammer where it is worked into bars. By this process wrought iron is made directly from the ore, but the process is not an economical one, as a large portion of the iron goes to form the slag. Only the richest ores can be used in this process; if poorer ones were used, the whole of the iron would be used in forming the slag.

The process now adopted to reduce the ore is by the blast furnace. I will not attempt to describe a furnace of this kind, further than to say that they are built of the most refractory material that can be procured, as the heat in them is very intense, and, unless carefully built, they burn out in a short time. They are from forty to seventy feet in height, and from twelve to eighteen feet in diameter at the widest part.

The ore is prepared by first roasting it, which is done by placing a layer of fuel on a level piece of ground and a layer of ore on it. This is repeated several times, and then it is covered with loose earth and set fire to. This is done to drive off the carbonic acid, sulphur and other volatile ingredients, and open the texture of the ore.

The furnace is filled with fuel and slowly heated, which requires from ten to twelve days. The heat is not increased very rapidly, as the furnace might be injured by being heated too suddenly. When the temperature is sufficiently high in the furnace, a layer of the roasted ore is put on the top: when this settles down, a layer of fuel is put on it, and then another layer of ore; this is repeated as long as the furnace continues in blast. A furnace will last from two to four years, and sometimes longer, when well constructed. As has already been stated, iron ores contain more or less quartz and clay, and as these require some other substance added to them to make them fusible, and the object being, by this process, to obtain all the metal possible, another substance has to be added to act as a flux. For this purpose lime is used, and although it does not make as fusible a slag as the oxide of iron, still it is more economical.

After the furnace has been lighted, a large quantity of air is forced in near the bottom by a blowing machine; the oxygen of this air, coming in contact with the heated coal, combines with it and forms carbonic acid; and, as we have seen in the other process, when carbonic acid comes in contact with heated carbon it gives up an equivalent of oxygen, and is reduced to carbonic oxide. This oxide acts on the iron by removing from it the oxygen which restores it to carbonic acid again, and, as the temperature is very high, the carbonate of lime is changed to quick lime, which combines with the quartz and clay, and forms a fusible slag. The iron at this high temperature has an affinity for carbon, combines with it, and forms carbide of iron. This and the slag being both in a fused state fall down to the bottom of the furnace; the iron being heavier sinks to the bottom, while the slag protects it from being oxidized by the hot air. When a sufficient quantity of iron is collected in the bottom of the furnace, it is allowed to run off into cavities made in sand, where it cools, and forms what is called pig iron. The amount of air forced into one of these large furnaces in twenty-four hours is almost incredible. It has been estimated at 6192 cwt., or 6292 cubic feet per minute; while the weight of fuel, ore and limestone was only 666½ cwt. This amount of air passing in cold reduces the temperature; by introducing the air heated between 600° and 700°, has greatly reduced the quantity of fuel. This is done by burning the gas that escapes from the top of the furnace; for, although a portion of the carbonic oxide is consumed in reducing the iron ore, a much larger proportion escapes at the top, and, by conveying this in suitable pipes, it is burned under heaters, through which the air has to pass before it enters the furnace.

This is a mere outline of the process of reducing iron ore. To describe the process in full, would take more space than we can give in the TIMES. Iron produced in this way is not pure, but contains a portion of carbon. The amount varies very much, but approaches nearly six parts in the hundred. The carbon renders the iron fusible, and, in this condition, it is used for casting.

IS YOUR LIFE INSURED?

BY GEO. T. BARKER, D. D. S.

From an editorial article in the January number of the London *Lancet*, on The Insurance of Life, we make the following quotation:

"The propriety of life insurance commends itself to the approval of every prudent man. It affords to many the only means of making ultimate provision for their families, and offers to all an opportunity of having money at their disposal for posthumus distribution. Its advantages are present as well as prospective."

For some time previous to reading the article above briefly quoted, my attention was drawn to this subject as eminently worthy of consideration in a dental journal, for I know of no class of men to whom to a greater extent the subject recommends itself, and by whom, as far as my experience goes, it is so completely ignored as dental practitioners. The merchant, the manufacturer and the artizan recognize and appreciate the value of life insurance, and why? I answer, because they have daily presented to notice the uncertainty of worldly possessions; houses of long-established reputation and credit, of reputed, and with often extensive wealth fail, or ask extensions, and are obliged to begin the world anew at the foot of the ladder where they commenced years previous. A commercial crisis appears periodically, and the prudent merchant expects and prepares for the winter of misfortune and unexpected loss of wealth; and how does he do this? By insuring his life, so that when loss of wealth and death comes he does not leave a wife and family unprovided for, who, unprepared for that fearful struggle with poverty, yet in order to gain a means of living, must battle with the hard, hard world, who can give nought but cold neglect. Let me, for example, look back only so far as 1855 and 1856: I then could point out merchants and manufacturers whose names were a tower of strength, and whose fortunes were considered secured beyond the possibility of loss. How many of them now stand, and if still in existence, do we not find that, to save their mercantile credit, their property was sacrificed, and many, many even then were obliged to succumb and yield to the unexpected loss of fortune and business? But how fares it with the professional man, the physician or the dentist? I contend, and expect to prove, that these men, above all others, are more liable to loss of fortune than any other class of men. Take for instance a dentist, who enjoys a lucrative practice, by which he lays by a certain sum, say one or two thousand dollars yearly, he accumulates, in a few years, a respectable sum of money—provided he has health, which few dentists enjoy—upon which he eventually expects to retire, but in his professional career, he becomes *intimately* acquainted with some banker, broker, or speculator on the "ground floor," who dazzles his eyes with the prospective "good thing," and unaccustomed as he is to business, he places his hard-earned profits in what may truly be called a "permanent investment." But there are certain reasons which impel professional men to embark in speculation to which I would direct attention. Such men as I have already stated, from their daily habits, become unfitted to be what I might term business men—a term which may not be comprehensive to some, yet by it I mean a peculiar power which a merchant must necessarily cultivate, to weigh judiciously the prospects of gain, and the possibilities of loss. The professional man, not being in the habit of employing this power, is like a mariner who sails without chart or compass, and whose chances are most sure for shipwreck. But there is one still more potent reason why these men yield to the spirit of speculation. The merchant or manufacturer, as he makes gains, can profitably invest them in his business, seeing there the legitimate field for investment; again, too, he knows full well that loss, made outside of business, affects, detrimentally, his mercantile credit and standing. But the physician or dentist has no such drawback. He says, I have the money idle, paying, perhaps, but a small percentage yearly, if I invest it I may make a large fortune, which I cannot hope to do in my practice in many years; another thing, if I loose it, it will not affect my business, and then, too, I have so much confidence in the judgment of my friend, who, as a great favor, lets me into this sure thing. This, my professional brethren, is no fancy sketch; I know a similar case well, and the physician of whom I write saw his hard earnings swept away, and not only that, but in the flower of usefulness and manhood was called from life to death, from works to rewards; and his beloved wife, who, during his life knew nought of poverty, has now to support herself and family by her needle. God help her, say I, in her affliction, for indeed she has much need; but may an all-wise Providence also awaken the minds of professional men to see that it is the *duty* of each one, who has persons depending upon him for support, to insure his life, so that, in case of sudden and unexpected death, they will not be left unprovided for. The legislators of the different States, recognizing the value and usefulness of life insurance, have provided that the debts of the insured cannot be recovered from the funds paid to the widow, or others for whose benefit the person was insured. It is, therefore, truly a safe and permanent investment, requiring only that it be entered into with a responsible company, and we are glad to state that there are many such in different parts of the United States; and as the calculations as to the average duration of life can be figured out to a *certainty*, it is for life insurance companies, a legitimate, safe and profitable business. But the advantage of life insurance need not alone accrue to heirs; the insured himself derives benefit. Every physician knows that one great cause of failure to overcome disease is the influence of the mind; if a person is ill, and his mind is not at rest, the efforts of the medical adviser are set at nought; his fear of death, and his dread of leaving a family unprovided for, has hurried many a man to the grave. This is avoided by the person whose life is insured, and he has nought to fear that nutrition will be modified by nervous influence, the effect of which we cannot appreciate, or understand.

Again, persons can insure their lives, as collateral security, for the payment of debts; the wife for her husband's benefit; and some responsible companies insure the payment of certain sums at certain specified ages. From a little work on this subject, we make the following extract, withholding the name of the company, because our desire is not to advance any special interest:

> "THE OFFICE OF LIFE INSURANCE.—By it the husband leaves a staff on which his wife and children may lean for support when the head that planned and the hand that toiled so gladly for them lies cold in the grave.
>
> By it the noble and affectionate son provides for the support and comfort of aged parents, who have watched over and nourished him up to manhood, should he die before them.
>
> By it any man or woman may provide for a moderate competence in old age, by the payment of small sums annually during early and middle life.
>
> By it the kind parent or friend may endow a son or daughter with a handsome start in life on attaining majority, by the payment of an annual sum from their infancy, which most persons can pay without feeling it a severe burden.

By it the prudent merchant, mechanic, farmer, or professional man may provide the means to pay off the mortgage on his home, and thus feel sure that in the event of his unexpected death that home will not pass into the hands of strangers.

By it the conscientious debtor can provide the means by which to protect the creditor, who has been his confiding friend, from suffering by him in case his life shall be cut short before that just claim is satisfied.

In short, this noble institution is a means by the aid of which, with forecast and economy, any person may provide against some of those sad consequences of premature death, the thought of which often haunts the mind when in health, aggravates the power of disease, and embitters the dying hour. None but the man who has experienced it can feel how truly agonizing is the thought that his beloved wife may soon be a widow and his children orphans not only, but that the opportunity of shielding them from want and providing for them a home has been neglected until it is too late.

Every young man just starting in business or just entering upon married life, every middle-aged man in any walk of life, every man and many women should ponder the question whether, in neglecting to embrace the advantages which this institution offers, on terms which are available to all, they are not despising and neglecting one of heaven's choicest blessings."

Reader, have you a mother, wife, children, or others dear to you depending on you for support? If so, we beg you to ponder this subject well, and ask, as you lay your head on your pillow, have I laid up treasures on earth for these loved ones, "where moth nor rust can corrupt, and where thieves cannot break through and steal?"

ON "SUBMARINE" FILLING.

BY H. SCOTT, D. D. S.

Bridgeport, Conn., Dec. 6, 1865.

Dr. H. Scott.—Dear Sir:—I have been reading an article written by you, for the Dental Times, in which you state that you are able to make equally as good a filling, "*submarine*," as by any other method. Will you kindly communicate your mode of doing this to the Times, that I, with many other students, may proffer by your experience and instruction.

Yours, respectfully, Fred. R. R. Crosby.

When I first read the above, I thought there was a masked doubt in the mind of the writer. I may have been mistaken.

There is nothing peculiar in my method. Success simply requires mechanism and carefully conducted labor. It is only in the lower teeth, of course, where I have sometimes been compelled to disregard the "*flood*." The cavity must be round. If there are any crevices running out, as is sometimes the case in the molars, I fill these first, thus making my cavity round. There must be good retaining points; that is, the dove-tail shape must be formed. I manipulate my adhesive foil with the fingers, into blocks and balls, until they are quite firm, and make as few of them answer as possible. These I mallet home substantially. I usually introduce my last block in the centre, shaping the place for its reception as an independent cavity. This kind of work, when artistically done, is simply a pile of masonry, the blocks of which fit together air and water tight; and if the borders are firm, the body of the tooth pretty round and the surface well finished, the work is just as good, and will endure as long, and preserve the tooth just as well as work done dry. I see occasionally fillings made by me in this mode from fifteen to twenty years since, with no indications of failure, and no apparent reasons why they might not be just as good fifteen or twenty years hence.

I have long since learned that some things can be done as well as others. I fill teeth dry when it can be done, because it is better and more convenient to do so; but there are mouths, where the saliva flows in so rapidly, that no method that I have ever known will keep it back, especially from the sublingual ducts; and I am satisfied that, in the early years of my practice, I directed so much of my attention to the ways of keeping the cavities dry, as to interfere materially with the success of my work.

The important ends to be attained in successful tooth filling, as all know, are firm borders, good retaining points, and solid work, with no possible crevice for the admission of fluids around the filling. Any method that will accomplish these will be a success, and any defect in either of these requirements will be followed by a failure. The best adhesive foils do not adhere, at any rate, where the surface has been made hard by the steel. There is no difficulty whatever in making durable work "submarine." Good mechanism, and patient, well-directed labor, will accomplish it.

LANCASTER, Ohio, January 6th, 1866.

REMOVAL OF A PIECE OF BEEF BONE FROM THE MOUTH OF A CHILD.

BY C. A. JORDON.

GENTLEMEN:—Some four weeks since a highly respectable lady of this city called at my office to consult me in relation to her little daughter, about four years of age, for whose precarious condition she manifested much concern. The lady stated that for the last five months the child had suffered terribly from "canker in the mouth," for which she had been under constant medical treatment during this whole period.

The first glance induced the belief that the disease was not in the mouth, but in the antrum. The mouth indeed was very sore, the breath almost unbearable, the cheek red and swollen, the eye inflamed and half closed, and the general health greatly impaired. I commenced an examination of the teeth, which I found to be entirely sound and unusually perfect. Prosecuting the examination more minutely, I discovered that the two molar teeth on the right side of the inferior maxillary were loose, though perfectly sound. Locating the seat of the difficulty here, by probing with an instrument, I soon discovered a movable substance lodged between these two teeth.

Taking two pointed instruments, one in each hand, and applying them to the ends of the substance, I succeeded without any difficulty in lifting it out from its bed. Upon examination, the intruder proved to be a piece of *beef bone* one eighth of an inch in length, about the thickness of a wafer in the centre, and terminating at either end with a sort of bulb, which rendered it impossible to remove it in any other way than that which I adopted.

The gum in the immediate vicinity had suppurated, and the alveolar process was in process of absorption and decay. How the bone got there is a matter of conjecture, but it probably was taken into the mouth with soup, as it presented the appearance of a chip or fragment of a soup bone. That it should have remained so long without being discovered by some one of the physicians who were called to prescribe for the case, seems almost marvelous. That it would have resulted in death, in less than five months more, I have no doubt; but with its removal, the health of the little sufferer has become quite restored.

BANGOR, Maine.

NOTE.—We rarely think it our duty to dissent with the diagnosis of a practitioner unless we can examine the case, but the above looks more like necrosis and exfoliation of a portion of alveolar process than like a beef bone, but we do not say such is the case.—ED.

* * *

FROM what we can learn, *unofficially*, the number of students in attendance at the different Dental Colleges in the United States is much larger than ever before, there being, in the aggregate, about one hundred and eighty; this, however, is about one-third the number that should be in attendance, but as large bodies move slowly, and when once started are not arrested by trivial impediments, so we shall hope to live to welcome the day that each school will have a class of at least two hundred—then teaching will not be what it is at present, entirely a "labor of love."

G. T. B.

INDIA RUBBER CONES FOR POLISHING VULCANIZED RUBBER.

Before I began to use vulcanized rubber as a base for artificial teeth, I had seen several of my professional friends using pine and cork cones, with sand paper attached to them by a ring of metal forced over the sand paper till it came near the base of the cone, which was attached to a small lathe, for the purpose of smoothing and polishing vulcanized rubber. That plan of procedure was always somewhat unsatisfactory to me, and I had received from a friend a piece of cast-away India rubber, which had been used on a railroad car, and laid it away for some future use, but at the time I did not know what I would want it for; but, as the pine wood cones did not last, nor work well with me, nor the cork cones, which were what are called jug corks by dealers in corks, I concluded to try how a gum elastic cone would work, and selected as sound a portion of the old rubber as I could get, cut out a piece as smooth as I could with my pocket knife; (but it was not very easy to work smooth, and dulled the edge of the knife very badly.) The largest one I made was about two and a quarter inches long, one and a quarter inches in diameter at the base, tapering to about half an inch in diameter at the point, which was rather too large in case a man had but one, but I find it advantageous to have two; one about one-third the size above mentioned. I made three sizes, but would recommend but two for that purpose.

Having used these three cones a great deal, I find they answer the purpose much better than anything else I have tried. They wear out very slowly, and their elasticity permits pulverized pumice stone, and tripoli, moistened or wet with water, to adhere sufficiently to answer the purpose very well. I found some difficulty in getting a hole in the centre to insert the tapering screw that belongs to and accompanies the *hand and foot lathe*, but I succeeded by the use of a tyne of a rat-tail file, which I heated a little, and by that means bored and burned it until I could screw it on and make it fast to the lathe.

If other dentists have not discovered anything better adapted to the purpose, I would respectfully suggest to the manufacturers of gum elastic toys and wares to prepare a mould with a conical central piece in it, so as to form a small hole in the cone, extending about two-thirds of the length, and manufacture a sufficient number of them to supply all the dentists who use vulcanized rubber as a base for artificial teeth: but if there are any other means better adapted to the purpose, I would be pleased to know of it, as I have been seeking the best means of performing the duties of a dentist for many years, and have rejoiced at many of the improvements which have been made, and gladly lend my feeble aid in the advancement of our profession. E. P.

Editorial.

TO THE PROFESSION.

That there should be some standard to separate those dentists who are well qualified to practice their profession, from others who are deficient in all the requisite qualifications, every well-informed practitioner must admit. But how can that standard be established? It will not do, at the present time, to divide them into those who are regular graduates of dental colleges and those who are not, and state that graduates alone should be recognized as dentists, for dental colleges have not been long enough in existence to make this the dividing line. Many dentists are now practicing who commenced before the first dental college was established, and others, by hard study and close application, have fully qualified themselves, and should be ranked as high as any in the profession. In order to assist in forming this dividing line, the Faculty of the Pennsylvania College of Dental Surgery have agreed, to allow those dentists, who have been in continued practice since 1852, to be eligible for graduation, *without attendance on lectures* at the college. The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must also undergo a satisfactory examination, when, if qualified, he shall be recommended to the Board of Trustees, and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

A REPLY TO "ARE YOU A READING MAN."

The December number of the *Dental Cosmos* and *Dental Register* each present a paper read before the Massachusetts Dental Society—published as original matter in both—under the above caption, by L. D. Shepard, D. D. S., of Salem, Massachusetts. The matter of much of the article cannot be objected to, but that portion to which we take exception, and most decidedly dissent with, is the following quotation:

"A moment ago I spoke of the necessity of familiarity with the old text-books and the recent publications of the profession. Of course you all understand by the latter I refer to the dental magazines—you know what they are, their standing, and the style of their articles. I desire to plead earnestly for their more extensive circulation. Foremost stand the *Dental Cosmos* and *Register of the West*—both able magazines and worthy of our patronage. From month to month I welcome their familiar faces. I take others, but regard these as best adapted for general circulation. *There are a number of publications issued as a means of adver-*

tising certain institutions, patents and manufactories, which have for the most part a gratuitous circulation. Some of these contain matter of interest and value, but for obvious reasons need no plea of mine."

Now what these reasons are, that are so obvious to Dr. Shepard, we are at a loss to know, particularly as he says that "some of these contain matter of interest and value." Why a gentleman, who is writing a paper intended ostensibly to encourage professional reading, should ignore entirely, except to attempt to cast a slur upon *four* out of the six dental journals published in the United States, is beyond our conception; but we shrewdly suspect that one cause of this treatment is due to the fact that *all* publishers of *dental magazines* did not furnish to this modern Diogenes the information as to their private business that he desired. For instance, one of the editors of this journal received from Dr. Shepard a letter, from which we extract: "In my investigations, I have discovered that the great majority of the profession do not take any magazine. I am preparing an article to read before the Massachusetts Dental Society on this subject. As I desire to be thoroughly informed on my subject, I addressed a note to Dr. ———, and obtained from him a list (confidential) of the subscribers to the ——— in New England. I would like the same information in regard to the TIMES, provided you see fit to so far let me into the publishing department. My article will be general in its influence as far as the different publications are concerned, and its only object to induce our members to read more generally the periodical literature of the profession. In order to make my appeal more direct and forcible, it is of great advantage to know how many men do not take any magazine. If you give me your list of subscribers, will you also give the number of gratuitous copies distributed in New England."

As the publishers of this journal could not see the advantage that the profession would derive from this information, they withheld the desired knowledge, which was doubtless the cause why the DENTAL TIMES was not of the "elect." But let us examine this exceptional statement still further. He says: "There are a number of publications issued as a means of advertising certain institutions, patents and manufactories." If we were to write this sentence as in our judgment it should be written, it would read: There are a number of publications issued by certain institutions, inventors, and proprietors of manufactories. And this is a truth which none can gainsay; and why is this? Why is it that *five* journals out of the *six* published in this country are published under just such circumstances? The reason is obvious when we recall how many that have been established, have perished, and that not a single journal remunerates the publisher—the most of them costing largely over what is received from subscriptions, and this is the cause why publishers must make use of journals as advertising mediums, else they cannot be supported. But, we ask, what objections can be urged to the issue of dental magazines by institutions, inventors, or manufacturers? We admit that these journals may do harm by excluding from their reading columns matter which might advantageously be published, but which would conflict with private interests; but does this occur? We believe it does not, and while there are *some* who may exclude from their advertising pages rival manufacturers, yet all, we believe, publish communications without regard to private interests. How can the gentleman expect dental journals to be supported by other than—what he would infer as unworthy—influences, when he states that only one in five in New England subscribe to a dental journal, and that, too, in a section of country noted for its general intelligence and information? There are two causes why dental journals are not supported, both of which are anything but creditable to the dental profession. *First.* But few contribute their dental knowledge; and matter of the right kind is not always attainable, unless large editorial corps are attached. *Second.* The majority are not regular subscribers. Take the case of the gentleman who writes so glibly of dental journals and duties of the profession, what has he contributed? We find, on examining the back volumes of the two journals that he states that he welcomes each month, for the past six years, that the gentleman's name occurs but to two articles, both of which, however, are the reports of the *business* (not discussions) of the Connecticut Valley Dental Association. One dental journal appeared, quite recently, containing only one original article of four pages, *thirty-eight* of selections, and three of editorial matter.

Our object in this communication is, however, not so much to take issue with Dr. L. D. Shepard, as it is to urge our readers, if any there be, who desire to emancipate dental journalism from the influence of institutions, inventors and manufacturers, to encourage dental literature by contributions and subscriptions, so that it will be a remunerative and profitable occupation. When that day arrives, private will never obstruct the public interest; but until that time comes, let us rather strive to build up and strengthen our dental literature, instead of making invidious distinctions, and greeting, as unworthy, all who do not come up to what we may consider as the true standard. Let us ask not who publishes the journal, but rather what does it present in the matter of mental pabulum, are its columns free, and is it devoted to the interests of the profession? If these can be answered affirmatively, we have nought to fear.

PHILADELPHIA. G. T. B.

NOTE.—Since this article has been put in type we have discovered in a recent journal an original article by the gentleman.

THE DENTAL JOURNALS.

The *Dental Quarterly* for December, edited by Drs. A. Tees and F. N. Johnson, and published by the enterprising firm of Messrs. Johnson & Lund, Philadelphia, comes to hand and presents for its readers much valuable material; the editorial of Dr. Ambler Tees, on "The Nerve Broach," being a particularly instructive and well-digested article, giving proof of careful study, and correct theory and practice. There is one feature in this number to which we might, as an impartial critic, object—not, however, more common with this journal than with others—it is the devotion of a large space to the republication of articles from other dental journals. This practice, common among the dental periodicals, is adopted, to a limited extent, among other professions, and its tendency, we contend, is to limit the general reading of *all* the dental journals, for the dentist very properly says, why should I pay for a number of periodicals when they all publish the same matter? This, however, is not always the fault of the editors, for some authors, desiring to give their effusions extended circulation, send the same article for publication as original matter, to appear simultaneously in different periodicals.

We are happy to see that our friends, Johnson & Lund, have received the prize medal at the World's Fair in Prussia, 1865, for excellence in the manufacture of artificial teeth; we believe they fully deserved it.

The *Dental Register*—no longer of "the West"—for December is at hand, laden with more than ordinary valuable original contributions. We should judge that though this journal arrives thus freighted, at a time when the year is just expiring, no signs of death and decay are present in it; but rather, like the old wood-fire that we love to look upon, for a time no light presenting, yet suddenly bursting forth in brilliancy and beauty, reflecting light and shadow on all that are near, so this journal gives evidence that our Western friends have had a "revival" in their midst, and we anticipate rich returns the coming year. We are happy to welcome our old friend, Dr. George Watt, back to the editorial chair, and above all are pleased that he has commenced a series of articles on Dental Materia Medica, a subject which, above all others, we feel, both as a teacher and a practitioner, an interest in.

The *Dental Cosmos* and *Dental Examiner*, each come to hand laden, month after month, with instructive, valuable and priceless information. Then with the new year let us one and all renew our subscriptions, and inwardly breathe the wish for success, long life, and continued usefulness to the dental journals, for upon them, as exponents of the advancement of the *science* of dental surgery, depends, to a great degree, the *status* of the dental profession, and its members as educated and intelligent practitioners.

G. T. B.

CONTRIBUTIONS TO THE MUSEUM.

Our valued friend, C. C. Williams, M. D., D. D. S., having recently returned from a somewhat extended trip to the Pacific coast, has presented to us a valuable memorial of his visit to the Sandwich Islands—a cranium of one of the natives, with a perfect and regular denture. While walking on the beach of the Island of Ohua he discovered it two-thirds buried in the sand, the part exposed, (the right parietal bone,) being bleached to a pearly whiteness. With his own hands he removed it from the sand, and found that the cavity of the cranium was filled with the bones of a child. The natives of the island were excedingly opposed to his taking it away, and offered him a valuable consideration to leave it with them, as they wished to retain it as a charm against the Evil One. Our friends are respectfully invited to examine it, as it is well worthy of. special study.

We are happy to inform the numerous friends of Dr. W. that his visit to the Pacific, in the search of health and strength, was to a good degree successful, and hope soon to hear that he has resumed his professional duties, that he has for so many years prosecuted with credit to himself and honor to the dental profession.

From Wash. L. Atlee, M. D., we have received a horn, about two inches in length and seven-eighths of an inch in diameter, removed by him from the face, below the right eye, of a gentleman eighty-eight years of age, a resident of this city; also a tooth, removed from an aged lady whose teeth had apparently been absent for many years; the peculiarity of the tooth consisted in the difficulty of diagnosis, which puzzled her medical and dental advisers. A swelling of a hard and dense character presented on the labial surface of the inferior maxillary, and was pronounced to be an exostosed tumor. The case coming subsequently into the hands of Dr. A., he determined it, by a careful examination, to be a bicuspid tooth that had never erupted, lying horizontally at the base of the alveolar process. He removed it with but little difficulty.

From Mr. Milton Keim we have received an interesting and rare specimen of a small sea animal, caught by him on the coast of New Jersey. Its name is "Equina Mare," and it presents, to all appearances, the miniature head of a horse, with the tail of a fish.

As custodians of these contributions for the museum of the Pennsylvania College of Dental Surgery, we publicly return our thanks to the donors.

G. T. B.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE TENTH ANNUAL SESSION, 1865-'66.

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PROFESSOR OF DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

EDWIN T. DARBY, D. D. S.,

DEMONSTRATOR OF OPERATIVE DENTISTRY.

J. M. BARSTOW, D. D. S.,

DEMONSTRATOR OF MECHANICAL DENTISTRY.

The Lectures to the Regular Course commence on the 1st of November and continue until the 1st of March.

During the last two weeks of October, preliminary Lectures are delivered, one each day.

The Rooms for Operative and Mechanical Dentistry are open from the 1st of October and throughout the session, under the supervision of the Demonstrators.

The Dissecting Room, under the superintendence of the Professor of Anatomy and Physiology, is open during the session.

Fees for the Course, (Demonstrators' Ticket included,)	**$100**
Matriculation (paid but once,)	**5**
Diploma Fee,	**30**

T. L. BUCKINGHAM, Dean,

C. P. REESS, Janitor. **243 North Ninth St., Philadelphia.**

P. S.—Board may be had at from $3.50 to $6.00 per week.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Tenth Annual Session, 1865-'66.

The tenth annual session of the Pennsylvania College of Dental Surgery will commence on the first of November, and continue until the first of March. Preliminary lectures will, however, be delivered each day during the latter half of the month of October. The Dispensary and Laboratory of the College will also be open from that time, where ample opportunities will be afforded for the prosecution of the practical part of the profession under the daily supervision of the Demonstrators, who are gentlemen of known integrity and thorough capability. During October, as well as the entire session, a clinical lecture will be delivered, and operations performed by one of the Professors every Saturday afternoon.

The course is so arranged that fifteen lectures are delivered each week, on the various branches taught in the school. A synopsis of the manner in which each department is treated will be found under the head of the different chairs.

These lectures occupy about the average time of three hours each day. In addition, four hours are daily spent by the student in actual practice. With this object in view, the operating rooms are furnished with twenty chairs, so arranged as to command the best light, and all the appliances necessary for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate.

Each student is required to provide his own instruments, (except those for extracting,) and to operate with them. He is expected to keep them in perfect order, and for that purpose is provided with a table in which they can be locked up when not in use. As the operations performed at the College are entirely gratuitous, a superabundance of patients invariably present themselves.

In the mechanical department every process known in the profession, which has any value to the mechanical dentist, is fully taught; and receipts of valuable compounds are freely imparted. All the conveniences are at hand in the Laboratory for the preparation of metals, manufacture of teeth, (single and in blocks,) mounting, etc.; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression to the thorough construction of the denture, and proper adjustment of it in the mouth of the patient.

In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of Dentistry, the celebrated hospitals and clinics of the city constantly enable the student to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Blockley Hospital, in particular, one of the largest eleemosynary establishments in the world, are open to Medical and Dental students, free of charge. The staff of this institution is composed of some of the most eminent physicians and surgeons of Philadelphia.

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COURSE OF LECTURES.

CHEMISTRY AND METALLURGY.

The course of instruction from this chair will commence with the consideration of the imponderable substances.

The laws that govern the imponderable bodies will next claim attention, with some notice of symbols or chemical notations. Individual elements, and the compounds resulting from their combinations, will then be considered. Organic chemistry will receive its full share of attention.

The course will be illustrated by diagrams and such experiments as can be performed before the class.

DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

The lectures in this department will embrace the Physiological Anatomy of the teeth, general and microscopical, in addition to a minute and careful description of the various operations performed by the dental practitioner.

The microscope, models and diagrams, will be employed in illustration.

At the Clinic the incumbent of this chair will also demonstrate before the class the various operations described in his course of lectures.

MECHANICAL DENTISTRY.

The instruction from this chair will embrace the entire range of manipulations legitimately connected with the laboratory, arranged in two divisions—Mechanical Dentistry proper, and that to which has been applied the appellation of the Plastic department.

I. *Mechanical dentistry proper* will include everything appertaining to the construction of dental substitutes, passing through the different stages of preparation, from taking the impression, to the completion and proper adjustment of the case in the mouth, conjointly with features, expression of countenance, enunciation, etc. It will likewise embrace the metallurgic treatment of the various metals employed, the preparation of plate and wire, the alloying of gold, together with the *alloys* used, as well as those designated as solders.

II. This division will comprise all that appropriately belongs to the manufacture of porcelain or mineral teeth—single teeth, block-work, continuous gum-work, vulcanite, etc. The materials, their preparation, compounds and uses, will be specially regarded.

All new inventions, modifications, and improvements, in this branch or the art, will in place receive due attention and investigation.

PRINCIPLES OF DENTAL SURGERY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist.

They will also include a careful examination of therapeutic agents and their general application. Their indications in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated, and also the general hygienic rules and principles which come within the province of the practitioner.

ANATOMY AND PHYSIOLOGY.

The instruction in this department will embrace a plain and comprehensive view of the structure and functions of the Human Economy. The valuable anatomical preparations of the incumbent of this chair, (consisting of Papier Mache manikins, models in wood, drawings, wet and dry preparations,) will enable him to fully illustrate his course. With the same object, vivisections on the lower animals will also be employed.

The special relations of this branch to the wants of the dentist will be kept steadily in view, and such descriptions of the natural history, microscopical structure, connections, &c., of the teeth, as their importance demands, will be given.

The great facilities for the study of practical anatomy, to be found in the city of Philadelphia, obviate the necessity of providing a dissecting-

room in the College. For the usual fee of $10, the student can have access to one of several well-ordered and well-supplied dissecting-rooms.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College; five years' practice, inclusive of the term of pupilage, will also be considered equivalent to the first course of lectures. If the candidate has been in continued practice since 1852, he is eligible for graduation without attendance on lectures. The candidate for graduation must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done, at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees; and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

TEXT BOOKS AND WORKS OF REFERENCE.

Wilson's, or Leidy's Sharpey & Quains' Anatomy; Carpenter's Physiology, or Dunglison's Human Physiology; United States Dispensatory; Mitchell's Materia Medica; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Pysiological Chemistry; C. J. B. Williams' Principles of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Paget's Surgical Pathology, or other standard works on the subject.

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DENTAL TIMES.

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THE DETERIORATION OF VULCANIZERS.

BY W. H. TRUEMAN, D. D. S.

The fact that vulcanizers in constant use rapidly lose their strength is, to the thoughtful mind, beyond dispute; and as it is an imstrument now so generally used by dentists, a few remarks upon this topic, the result of observation and experiment, may not be without interest. Many articles upon the power of steam, and the strength of materials, have appeared in the various journals, and any dentist must be inexcusable indeed who is ignorant of the requirements a vulcanizer must possess to render it what we consider *safe*. Although so much has been said upon the selection and choice of material, and the care to be used in manufacture to make them strong, the means to keep them so seems to have received but little attention. Those agencies so silently, yet industriously at work to transform that harmless and useful companion of our laboratory into an uncontrolable, destructive monster, have either failed to attract attention, or have been deemed almost unworthy of notice.

The first, and perhaps the most important cause of their gradual destruction, is found in the gasses evolved during the process of vulcanizing, which appears to have, comparatively, a powerful action upon copper, of which metal most of our vulcanizers are made. The intensity of its action is not generally observed, on account of the small quantity generated finding its way into the chamber of the vulcanizer, the greater portion being arrested by the plaster of the mould, but enough escapes to produce a marked effect.

I suppose but few have failed to notice the discoloration of the water, and the dark deposit upon the flanks and the sides of the vulcanizer. This deposit in the vulcanizer of slovenly dentists, will be found to form quite a thick coating, composed for the most part of sulphuret of copper, formed at the expense of the copper of the vulcanizer. This action, (the formation of sulphuret of copper,) takes place every time the vulcanizer is used, and it remains a question to be answered, by mathematical calculation, how long a vulcanizer can be used with safety. I anticipate, unless means are taken to prevent it, hearing of numerous accidents, when sufficient time has elapsed to render this action manifest. From experiment, it appears that the gasses are not given off until considerable heat has been applied, and they, being in the nascent state, we have every condition favorable to chemical combination, and the strong affinity between sulphur and copper leaves no room for doubt as to the action which takes place. In using tin to form the air chamber of vulcanite cases, my attention was called to the perfect manner in which that metal resisted the action of these gasses, being but little, if any, inferior to platina or gold, and much superior to any other metal I have tried in a large number of experiments bearing upon this point.

Some time ago I procured one of Howel's packers, and, after using it a short time, threw it aside on account of the unsightly appearance the work produced by it presented; the surface being covered with numerous black streaks and spots. A few months ago I tinned the lower part of the inside of the barrel and the bottom of the piston; the difficulty is entirely removed, the work coming out as clear as though packed by hand, and were it not for the miserable material, and poor workmanship displayed in its construction, should consider it an invaluable assistant. By what I have observed in this and numerous other experiments, I think that by giving the internal surface of the vulcanizer a heavy coating of pure tin, this action could be almost completely resisted, and if the flasks were also coated with it, the annoyance all have experienced, of having their hands so badly soiled, would be in a great measure avoided, and the durability of both flasks and vulcanizer much increased.

The relative action upon tin and copper of the sulphur gasses evolved in vulcanizing, may be readily demonstrated by the simple experiment of placing the polished surface of a piece of tin and a piece of copper in contact with rubber in vulcanizing; while the copper would be very much roughened, the tin would be only slightly discolored.

By means of chloride of zinc, or chloride of ammonia, the bright clean surface of a new vulcanizer could be readily tinned at a very slight expense, and if the manufacturer of them would attend to it, the utility of the instruments would be much increased.

With one that has been in use the process would be more tedious, on account of the difficulty of making the surface of the copper clean enough to ensure a perfect coating; if any imperfection was left, it would, in all probability, render the apparatus weaker and more dangerous than at first, as all the action would be developed in one spot. The constant and often-repeated strain to which vulcanizers are subjected, would be very likely to prove injurious to a weak instrument, and the practice of some, to raise the heat as quickly as possible, by causing the force to be exerted suddenly, would develope any existing flaw, if it would not create defects, and thus pave the way to disaster. Forty-five minutes or an hour is time little enough to reach the vulcanizing point with safety.

The practice of filling the vulcanizer with hot or boiling water, although it saves much time, is a dangerous one. When the head is placed upon it, the bulb of the thermometer is brought into almost immediate contact with the boiling water, and the sudden elevation of temperature is liable to cause defects in it, which become developed in vulcanizing, and make it register ten, twenty, or thirty degrees below the actual heat, and the astonished operator might have the exquisite delight of seeing his vulcanizer take an ill-directed ærial flight before he was aware of it. Such defects in thermometers I have, on several occasions, noticed from the above cause. Sudden changes of temperature, either in heating up or cooling off after vulcanizing, should be avoided. The old time-honored proverb of "more haste less speed," applies with much force in this connection. By careful attention to their management, the lives alike of the vulcanizer, and those who operate with them, may be rendered more secure. In fact, there is no operation in dentistry, however simple, in which carelessness is admissable, as many have found to their cost.

DENTAL EDUCATION.

BY T. L. BUCKINGHAM, D. D. S.

In the April number of 1865, of the DENTAL TIMES, I published an article on dental education. As a basis for the article, I made an extract from the London *Dental Review*, in which the writer, in noticing the dental colleges in this country, remarked that he feared, "that the number of those institutions tends to thwart the very object for which they were established, and that, in consequence, the standard of professional education is tending downwards rather than upwards." In order to show that the tendency would in all probability be downwards where the colleges were located close together, I referred to the effects on each other of the two principal medical colleges of this city, which had, up to that time, been held up as examples to show the necessity of another dental school. I showed, by facts which have not been contradicted, that the oldest medical institution in this country, with a reputation almost as extensive as the medical profession, and an invested fund sufficient to support it without requiring any fees from the students, if this had been necessary, had lowered its standard by shortening the sessions and reducing the fees, and no other reason could be given for so doing but that another similar institution was in operation in close proximity, whose sessions were shorter and fees lower. I have not heard of these colleges being referred to as reasons for more dental schools since the paper was published.

My article was replied to by Dr. J. E. Garretson, in the *Dental Cosmos*, and although I think he failed to answer my arguments, still there was an open manliness about his article that commands respect.

In the January number of the *Cosmos*, another article on the same subject, by one of the editors, was published; but, instead of publishing it under his own name, he sent it as a communication to the Merrimack Valley Dental Association, which met at Concord, N. H., on the preceding 2d of November, thereby making it part of their proceedings, and then publishing it as such, so as to shift the responsibility in a measure from himself to them. This is characteristic of the author; for, in all his writings, he has never stood up and fairly met statements which he did not agree with, but, in some short sentences, he would put in an offensive remark, that was intended to irritate rather than refute anything that had been said on the subject.

But let us examine some of the statements in the article and see if the author has not misrepresented some transactions of another institution of which he was once a member, and it is to correct these errors that I have noticed his article at all. For I presume it was intended more as an advertisement than for any other purpose, as he commenced by saying, "the subject is suggested to my mind by the fact that the period has again arrived for the opening of the dental colleges; and if, as has been reiterated on different occasions in our magazines, dental education is tending downwards rather than upwards, it becomes a matter of grave moment to the student who has at heart his own interest and those of the profession of which he desires to become an honored member, that he should be exceedingly careful in selecting the source whence he shall derive his professional education." The writer devotes a considerable portion of his article to show that dental education, in the profession at large, is tending upwards, which has never been disputed, and he attributes this advancement partly to the teachers of the colleges who have taken part in the Associations, and contributed to the literature of the profession. But he says, "owing to the small number of students heretofore in attendance at the colleges, the influence of the faculties in this direction in dental education, has been exceedingly limited," and he might have said that, with even this small number, their education had been better than it would have been had they remained in private offices, for the only question that has been raised is, is the curriculum in the colleges progressing? But this question is carefully avoided. After giving some general reasons why he thinks the standard of dental education is tending upward, he writes this sentence about himself: "Well do I remember the feelings of distrust with which ten years ago, having declined in preceding years the position, I entered upon the discharge of such duties, deeply conscious of my own deficiencies, and fully recognizing those of my colleagues." This sentence would not be worth noticing, but as he has reiterated the same statement on several occasions, it would be a satisfaction to some of us to know when he was called to a position in a college before the time he accepted. I have no knowledge of a position being tendered to him in either the old Philadelphia or Pennsylvania Dental Colleges, and as I have been a member of their faculties since they were first organized, I think, if the position had been tendered, I would have heard of it.

But he is also not very particular about dates, for he says he entered upon the discharge of the duties *ten years ago.* Now the article under consideration was read on the 2d of November, 1865, and the first course of lectures in which he took part commenced on the first Monday in November, 1857, just *eight years* before; and in the same sentence he writes that he was "deeply conscious of my own deficiences, and fully recognizing those of my colleagues." Well, even at that time, it appears he had as good an opinion of himself as he had of his associates.

Passing from these trifling matters, we come to a more serious sentence in his article, for in it he endeavors to injure another institution. After giving some reasons why he thinks the instructions now given are more thorough than formerly, he writes, "In addition to this, I feel satisfied that the standard of requirements for graduation on the part of all our institutions is of decidedly a higher order than used to prevail, and should be exceedingly sorry to think otherwise, for it certainly was low enough at a time when a sense of duty prompted me, as an individual member of a faculty, to protest to the Board of Trustees against the laxity which existed in that particular," and in order that the readers might not be mistaken in the institution, he adds, "this, however, was in another institution than that with which I now have the honor to be connected." Now the fact is, he never did protest to the Board of Trustees against the laxity of the examinations. In one case, after the ballot had been taken, and the candidate had been passed by the Faculty, and he, with the rest of the Faculty, had signed a recommendation to the Trustees to graduate the student, he went home and wrote a protest to the Trustees, requesting them to withhold the diploma, but the Board took no notice of the protest. That he ever protested against the general laxity of the examinations to either the Faculty or the Board of Trustees is not so. If there had been no personal feelings in this case, my impression is there would have been no protest, for the candidate stood higher with the other members of the Faculty than some others in the class.

Let us examine the next sentence, and see how generous he is in regard to the experiences of the past, and how forgetful of some more recent transactions. "Like some other experiences of the past, which I have been disposed to permit to sink into oblivion, rather than bring them under the notice of my fellow-practitioners. I should have made no reference to this, but for the assertion that of late students have been guaranteed their diplomas before matriculating, and then graduated upon two months' instruction. That such things may have been done is possible. I sincerely believe, however, that such charges cannot justly be brought against any dental institution."

Probably if some of these experiences were told they would explain some others, which, being half told, convey very erroneous impressions; but as I do not know exactly what he alludes to, I can only advise him to tell all—he had better out with it at once, than be weighed down all his life in keeping secret some grave offence. Now let us see if we can enlighten him on some parts of the above sentence, as he appears to be so exceedingly oblivious.

Did not the *Dean* of the institution of which he is an honored member, matriculate a student from Massachusetts, between Christmas and New Year's day, the first session the college was in operation, and graduate him on the 1st of March following? This is a plain question and easily answered, for their class was not very large. The dates we have definitely fixed, for the student had made application to the other college and was refused, and the published reports show that he did graduate at the time mentioned.

This is the case alluded to in my previous article; others might be pointed out, but as the dates are not so well fixed, I have not thought proper to mention them. And thus, following up this same paragraph, we have a modification of the previous sentence; for it is stated, "It is true that practitioners, who have been diligent students for years, and thus, by close application to their books, have made themselves as thoroughly acquainted with the various departments of science as they were skillful operators, have, after an attendance upon lectures for a few months, come forward as candidates for graduation, and passed the ordeal with the highest honors." Now I do not know that I have any more right than any one else to object to a Faculty adopting any course of instruction or term of practice as equivalent to the instruction they please, but when they publish in their announcement that it requires "five years' practice, inclusive of pupilage," to be equivalent to the first course, and the second course must be attended in the institution, and then take students on less than two months and graduate them, they can hardly say the standard of dental education, at least in that of attendance, is raising, and the profession scarcely knows what the requirements are, as these students are classed and ranked with the regular matriculants, and march up and graduate in the same manner, their names being published in the same list with regular graduates, so that it is impossible to separate them unless you are personally acquainted with them. What we ask is, to let the profession know what is being done, and then leave it to them to judge whether the tendency is upwards or downward—do not publish one thing and practice another.

There is one other sentence in this paragraph that I want to notice and then I shall be nearly done. "The influence upon dental education is far more salutary when such men come forward and submit to an examination on the part of a competent and reliable faculty, who shall decide upon their right to possess a diploma, than when the so-called *honorary diplomas* are distributed, *ad libitum*, upon gentlemen who, however worthy as men and practitioners, have neither attended lectures, submitted to an examination, nor distinguished themselves in any way as contributors to the science and art of the profession," and then he attempts to apologize for parts of this by saying, "There may have been a period when such practices were, to a certain degree, admissible, but that has passed away." The only time when such a charge could be brought against the dental colleges in this city was at the close of the first session of the oldest college, and then I must admit they were distributed rather liberally. The gentleman himself received one, which I suppose he still honors, as he continues to use the D. D. S.; I am not aware that he received in from any other source. But as diffusively as they were given at that time or since, the names of all the recipients have been published in either the *Dental News Letter* or *Dental Cosmos*, except three in the old school, which the Trustees persisted in giving in opposition to the Faculty, and three in the Pennsylvania College, two of which the gentleman himself assisted in recommending, and the other fills the place he occupied in the college.

The last that I shall notice is, "To say that the increase of schools by inducing competition tends to degrade education indicates, if not an entire ignorance of the subject, at least narrow and contracted views of it." And then he refers to the Grecian Republic, England, France, Germany and the North-eastern States, to show that the education of the inhabitants of those countries must be attributed to the numerous universities, colleges and schools which had been established in them.

Who has doubted this, or attempted to question the necessity of more than one school? I advocated, in my first article on this subject, several schools in various parts of the country, and stated that they would strengthen each other. But was it to advance dental education, that parties who could not rule the school they were in, established another? Can one single instance be pointed out where two schools, depending on the students' fees for support, have been established in close proximity to each other, where they have not re-acted upon each other, and the standard has been reduced in one or both? Now this is the point I started upon, and this question has not, nor cannot be answered but by admitting that such has been so, and must continue to be so.

DENTAL SURGERY—SHOULD FEMALES PRACTICE IT?

BY GEO. T. BARKER, D. D. S.

Before considering the latter portion of the title of this paper, I propose briefly to call attention to certain requirements which I consider imperatively necessary for persons to possess to enable them to successfully practice dental surgery. The two most prominent requisitions, which in my judgment are the most important, are that the person about to enter the profession should possess a mental and physical constitution of a high order; if he be deficient in either he is unfitted for dental practice, and should be advised to abandon it. The practice of dentistry is calculated to undermine the very best balanced constitutions, which is attested by undeniable facts, and which can be explained on truly physiological principles. The cause of this is due to the double demand which is made simultaneously both upon the mental and physical powers. Let us, for example, take the ordinary routine of daily practice: two or three cases of exposed pulp, or obscure toothache present, difficult cavities to excavate and prepare for filling, treating periostitis or alveolar abscess, successfully welding piece after piece of gold to its proper situation, the application of strong hand pressure, until, perhaps, the very hands are blistered, with the necessity of taking frequent positions which interfere with respiration, circulation and digestion; when this work is gone through with day after day, is it surprising that dentists do not enjoy good health and long life?

Let me ask any one whose labor is strictly physical, or purely mental, and I believe that either would state that their task is easy, or burden light in comparison with the practitioner of dentistry. It is a law of nature that if we make mental exertion the blood is directed, in increased quantity, to the brain; so, also, if we make physical effort the blood is diverted to the extremities and the surface of the body. If an author desires to write a book, he selects some place where all is quiet about him, he sits in his study and engages in nothing but mental labor, and yet on every side this is admitted to be exhausting and, if long continued, the health is destroyed. The artizan or laborer who puts forth only animal strength whistles or sings at his work, as it is with him but a mechanical operation; his mind is not studying the every movement of his fingers, but they continue in their work requiring but an occasional thought or examination. This I have repeatedly remarked when watching jewelers, watchmakers, engravers, shoemakers, and indeed I might add all mechanics and laborers in the field. I would not be understood as giving forth the idea that these occupations do not require close study to reach perfection. But what I desire to state is this, that a man may plough a field well, and yet not devote much thought to the very occupation, but his mind may be engaged in other and more congenial fields of thought, and this very occupation of mind acts as a restorative to the physical energies. In dentistry, as previously remarked, the demands are made upon the mind and strength at one and the same time. The simplest operation in operative dentistry is not mechanical, for it must always be performed differently and under unlike circumstances, and demands the active use of the mind and strength; this double call upon the blood for vital force and energy, often leaves us, when a long and protracted operation, in a tedious position, has been gone through with, weak, tired and spiritless, in other words, utterly exhausted. This feeling I have frequently experienced, and am one who has enjoyed through life more than ordinary good health, never having been ill, except slightly, until I had been seven years a dentist. Let any one who visits our Conventions, or Association meetings, remark how few old practitioners, say of twenty-five or thirty years' practice, are present; and if there are, how many of them complain of loss of eyesight, or dyspepsia and indigestion. The cause of this in my mind is plain; after eating, the stomach being distended with food, nature requires that there should be a period of repose from mental and physical labor, the blood vessels and capillaries in the region of the stomach become engorged with blood; the gastric juice is from this blood secreted, and, if normal in quantity and quality, preparation of the food in the stomach for the continuation of the digestive process takes place. But, on the other hand, the dentist no sooner partakes of his breakfast than a call is made which requires immediate attention; he obeys that call, as it is one of suffering, it takes longer than he expects, and others crowd in upon him until he is fairly launched into the day's practice. Now let me ask what opportunity has the stomach been allowed for the performance of its duty? None. The blood has been directed to the brain and the surface, and the demands of nature have not been met; for years, perhaps, no thought is taken of the matter, but ere long these outraged laws are found to have entailed a penalty, and dyspepsia, with its long train of evils and disagreeable sensations, presents itself. Aware of this, I have, fas ar as in my power lay, endeavored to persuade the gentlemen who have been present at my lectures to adopt the plan of eating but two meals daily, taking in the middle of the day a light nutritious lunch, the last hearty meal being enjoyed after the close of the labors of the day, when it can be followed by a sufficient season of mental and physical repose. I know there are some who will keep a patient in agony while they enjoy a rest after each meal, but the practice is an evidence of heartlessness and want of feeling on the part of the practitioner to the patient, and is so understood by the latter. It may be urged by some that a certain number of hours each day should be devoted to out of door exercise; this I grant, but who can obtain it? The one whose practice is not extensive does not need it, and he must needs stay at home to receive and extend his practice, it being a universal rule that the largest fish usually come to the net when there is no one to catch them, and it is only the patient, never-wearying fisherman that derives the advantages of the smallest nibbles which usually come from the largest fish. To succeed in dentistry a practitioner must be always at hand, with services ever ready at the command of the public. The dentist, on the other hand, whose practice is extensive, even with the greatest caution, cannot leave time enough for pleasure and recreation, as so many cases present themselves which require immediate attention. I have been repeatedly urged by patients, to whom those views have been stated, to join some base ball club, or spend a certain number of hours riding on horseback or boating, but always ask for a plain answer to the following question, viz: would you, if you were suffering and needed dental attention, consider that I was, or was not neglecting my practice, if you asked for me at my office and was told I was playing base ball? They have invariably answered in the affirmative. I do not state that this would be a just conclusion, but, nevertheless, it is a natural one.

But to the latter portion of this essay. Should females be encouraged to enter the dental profession? I contend they should not, and it is with no disrespect that the assertion is made. The same reason holds good against females practicing dentistry that it does against a feeble male, for the reasons as previously stated. The very form and structure of woman unfit her for its duties. Again, I contend that its performance would, under certain circumstances, be attended with great danger. One of these circumstances may be cited; as, for instance, in pregnancy. Who would encourage a female to perform a trying and difficult operation at such a time, and must not a woman neglect her family for the performance of dental practice? Have we not, as dentists, sufficient evidence of the great injury that mothers are inflicting on their offspring by not furnishing them with nutritious breast milk, but, on the contrary, bringing them up by "hand:" the child, as a consequence, being deprived of the phosphates and carbonates of lime, magnesia, &c., grows with teeth carious and defective in structure. That the sphere of woman's usefulness should be extended I, for one, justly urge; that she is now debarred from entering many occupations for which she is fitted, I allow; but to me it seems dentistry is not one of the class of occupations for which she is fitted physically, though she is mentally, and it is with regret that the statement is made; for were we only to have some of the mental energy of women infused in our profession, it would stimulate some of its members doubtless to increased activity, particulary in the science of dentistry. It may be urged by some that woman is capable of great physical exertion, and I may be instanced to the German women, who work in the field, or the Indian squaw, who performs the out-door labor while her husband peacefully reposes. This is admitted as an argument of what women can do; but I would answer, that from such classes, and from such occupations, mental culture of a high order cannot be expected. I will admit that women can, by cultivation, develope either the mental or physical energies to a degree equal to man; but that she was, by an all-wise Providence, fitted or designed for great physical labor I deny, or, for what is more trying, a development to a great degree of both simultaneously.

My views on this subject have been called forth by the election to membership of females in some of our Western Dental Associations, and by the views promulgated by certain prominent practitioners and writers. Impressed with the truth of this position, I propose to offer an amendment to the Constitution of the American Dental Association, at its next meeting in Boston, to allow none but males to be eligible as delegates from local Societies.

TENTH ANNUAL COMMENCEMENT OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Tenth Annual Commencement of this Institution was held on the evening of March 1st, 1866. The evening being propitious, an unusually large and appreciative audience was present to witness the interesting ceremonies that close the course of instruction; an encouraging evidence that the public are beginning to appreciate fully the necessity of thorough education in this important branch of scientific attainment.

It will be seen, by reference to the following list, that the numbers of the class, and the graduates, far exceed those of previous years; this is gratifying, inasmuch as it evidences an increasing determination on the part of the profession toward a higher standard of qualification for admission to its ranks. When we remember that the class is composed of persons who represent very many sections of the country, in connection with the fact that all our dental colleges have had, the past winter, largely increased numbers, is abundant and gratifying proof that the time is fast approaching, if it has not already arrived, when the diploma of a dental college will be considered essential to professional character and reputation.

The order of exercises consisted of music by the Germania Orchestra, prayer by the Rev. Dr. Bomberger, conferring the degrees, and the valedictory address by Dr. James Truman, Professor of Dental Physiology and Operative Dentistry.

The Degree of Doctor of Dental Surgery was conferred upon the following named gentlemen by Henry C. Carey, President of the Board of Trustees.

GRADUATES, 1865–'66.

John P. Adams,	New York,	Salivary Deposits.
George K. Bagby,	Virginia,	Nitrous Oxide.
Henry Berhard,	New York,	Causes of Caries.
Thomas H. Bradfield,	New Jersey,	Inflammation.
Francis A. Brewer,	Missouri,	Dentistry a Science.
Samuel C. Britton,	Maryland,	Predisposing Causes of Caries.
Charles Buffett,	Ohio,	Arsenic.
Perley M. Christie,	Penn'a,	Inflammation.
William H. Crary,	New York,	Rubber *versus* Metal.
Edward S. Davenport,	"	Iodine.
Francisco Dominguez,	Cuba,	Inflammation.
Eugene C. Flamand,	"	The Art of Filling Teeth.
Hamilton Forrest,	Maryland,	Decay of the Teeth and Treatment.
Albert Hape,	Georgia,	Dentistry a Science.
John A. Hauser,	Penn'a,	Treatment of Exposed Pulp.
Milton Keim,	Michigan,	Artificial Dentures.
Wash. K. Lineaweaver,	Penn'a,	Inflammation.
Francisco Mignotte,	Cuba,	Extracting Teeth.
James W. Nelson,	Tennessee,	Indigestion as a Cause of Caries.
Henry S. Noble,	New York,	Antrum Highmorianum.
Francis A. Ramsay,	Penn'a,	Sensitive Dentine.
Henry C. Register,	Maryland,	Digestion.
Louis Jose Salicrup,	Porto Rico,	Extraction of Teeth.
William Smedley,	Penn'a,	The Fifth Pair of Nerves.
Henry J. Smith,	"	Sensitive Dentine.
James S. Thomas,	New York,	Chemistry.
William H. Trueman,	Penn'a,	Materials for Filling Teeth.
Agustin de Varone,	Cuba,	Development of the Teeth.
Julien J. Vanderford,	Maryland,	Dentistry.
John H. Vedder,	New York,	Treatment of Irregularities.
Ransom Walker,	"	Diagnosis.
William C. Wardlaw,	S. Carolina,	Anæsthesia in Dentistry.

John B. Wheeler, ...New York,..The Dental Pulp.

A. Lawrence,.........Mass.
J. M. Barrett, ...Penn'a.
W. G. A. Bonwill,.....Delaware.

In practice since 1852.

MATRICULANTS—TENTH ANNUAL SESSION, 1865–'66.

J. P. Adams,.........New York.
Stephen Armas,.......Cuba.
G. K. Bagby,.........Virginia.
J. M. Barrett,........Penn'a.
Edward Bedloe, ... "
Henry Berhard,.......New York.
E. M. Beesley,........N. J.
T. H. Bradfield,....... "
W. G. A. Bonwill,....Delaware.
F. A. Brewer,........Missouri.
Samuel C. Britton, ...Maryland.
Charles Buffett,.......Ohio.
P. M. Christie, ...Penn'a.
R. L. Cochran, ...Iowa.
Wm. H. Crary,.......New York.
Frank Darby........ "
S. C. Dayan,......... "
Edw. S. Davenport,... "
Timateo P. Dias,......Cuba.
Francisco Dominguez,.. "
E. C. Flamand,....... "
Hamilton Forest,......Maryland.
Simon Frau, D. D. S.,..Cuba.
Rafael Gonzales,......Spain.
Asher B. Greasemer, ..Penn'a.
Albert Hape,.........Georgia.
L. B. Henderson, ...N. C.
J. A. Hauser,........Penn'a,
Milton Keim,.........Michigan.
A. Lawrance,.........Mass.
W. K. Lineaweaver,...Penn'a.
Thomas F. McClure,... "
Daniel Martin,........ "
Mariam Martorell,.....Porto Rico.
Francisco Mignotte,....Cuba.
H. W. More,.........Penn'a.
J. W. Nelson,........Tennessee.
Henry S. Noble,......New York.
W. Pellett, ...Illinois.
Casimer del Portillo,...Cuba.
W. B. Race,.........New York.
F. A. Ramsay,........Penn'a.
H. C. Register,.......Maryland.
John E. Register,..... "
Louis Jose Salicrup,...Porto Rico.
Peter Schembs,........Penn'a.
W. Smedley,......... "
H. J. Smith, ... "
C. W. Strang,........New York.
James Tait,...........Penn'a.
Henry F. Tefft,........Maine.
James S. Thomas,.....New York.
Isadore Tolon,. ......Cuba.
John R. Thompson,....S. Carolina.
A. P. Tompkins,......Penn'a.
Wm. H. Trueman,..... do
J. J. Vanderford,......Maryland.
Agustin de Varone,....Cuba.
John H. Vedder,......New York.
Francis Vega,........Porto Rico.
Erastus Walker,......New York.
Ransom Walker,...... "
W. H. Walker,.......Wisconsin.
Wm. C. Wardlaw,.....S. Carolina.
J. B. Wheeler, ...New York.
O. N. Whitney,.......Illinois.
Wm. Williamson,......Penn'a.
E. Wilson,... ....New York.
J. H. Winslow,....... "

The Demonstrators report the following operations performed in their departments during the past session.

DEMONSTRATOR'S REPORT, SESSION OF 1865–'66.

OPERATIVE DEPARTMENT.

Number of Patients visiting the Clinic,	2480
Number for whom the following operations were performed,	1692
Gold Fillings,	671
Tin “	562
Wood's Metal,	25
Hill's Stopping,	28
Amalgam,	18
Treatment and Filling Pulp Cavities,	180
Superficial Caries Removed,	20
Removal of Salivary Calculi,	64
Treatment of Periostitis,	18
“ Alveolar Abscess,	28
“ Inflammation of the Gums,	11
“ Partial Necrosis,	8
“ Irregularities,	20
Pivot Teeth Inserted,	2
Extraction of Teeth and Roots,	2107
Total,	3759

Edwin T. Darby, *Demonstrator.*

MECHANICAL DEPARTMENT.

154 *Patients were supplied with the following Artificial Dentures:*

Whole Sets of Teeth,		43
Full Upper Sets,		50
Full Lower Sets,		3
Full Upper Set, on Porcelain Base,		1
“ “ Block,		1
“ “ Continuous Gum,		1
Partial Upper Sets,		47
Partial Lower Sets,		7
Obturator,*		1
Teeth Mounted on Metal Base,		508
“ “ Hard Rubber Base		1694
Whole Number of Gum Teeth,	1548	
“ “ Plain Teeth,	664	
Number of Teeth Mounted for Patients,		2212

* Made for a soldier having lost his teeth and some of the adjacent bones from a gun-shot wound.

Depositing Sets.

18 Full Upper Sets, on Hard Rubber Base, No. of Teeth,....	252	
2 Partial Sets, " " " "	13	
1 Full Upper Set, Continuous Gum, " "	14	
16 Full Upper Sets, on Metal Base, " "	224	
		503
Total Number of Teeth Mounted,......................		2735

J. M. Barstow, *Demonstrator.*

The arrangements for the practical demonstrations of the two branches, operative and mechanical, must be seen in full operation to be appreciated. The reports give but a faint idea of the very great value these are to the student. Private instruction is of importance and absolutely essential, but it cannot compare in thoroughness to that received under competent demonstrators, assisted by the example and influence of advanced students. The experience of those who have spent years in educating large numbers of young men for professional duties, satisfies them that the mode adopted is the best attainable to fulfill the desired end—giving the graduate of two courses all the experience that years could alone accomplish in private practice. He is not a mere novitiate, but goes forth trained to meet difficulties with that manipulative skill that must at once command the confidence and esteem of his patrons. We, therefore, do not hesitate to urge all who expect to enter private dental offices, to decide in advance to close that very important training by entering one of our many colleges, and graduate in time with honor to themselves, and with a prospective future of value to the profession.

The ceremony of conferring the degrees was followed by Dr. Truman, in the closing address, a full report of which we append.

VALEDICTORY.

The commencement of life! How profound the significance that lies concealed in that short sentence. What hopes, fears and anticipations are enshrined within its full meaning. Childhood has its dreams and its pleasures for the hour—maturity brings with it the golden pathways of a future. In middle life, the past sobers the present joys, and with its experience we look beyond to a plain highway, upon whose borders no temples are reared but those that correspond with the architecture which the travels of many a day have made us conversant with. In old age we come again to build in the future, but not the future of childhood; it is that which all ages have hoped for, all nations have cherished a belief in—one based on an eternity of experiences. It is with no common feelings that I rise to address you this evening, not you alone who are to go forth from this hour as ministering spirits to poor humanity, who have been crowned, not with kingly gew-gaws, but with that higher decoration, a testimony to your faithful labors in your chosen field of scientific research, but to you who have come to show, by your presence, that you can mingle with us in the rejoicings, fears and solemnities of this hour; for all these are blended in the feelings of both teacher and graduate—rejoicings at the successful completion of a work earnestly labored for; fears and anxieties that the future may develope all that can be legitimately hoped for, and the solemn feeling that this hour brings with it a separation with many in which a reunion can take place no more for ever. It is to you who are not of the profession, of which I am in part the representative this evening, that I desire to say a word.

You come to cheer on the young aspirant for honors, well deserved, in the beginning of his career. Are you equally as well prepared, not only to give the good word of cheer, but also to bestow upon him that substantial evidence of it, that comes by employing his professional services when required? The time has passed when men should be countenanced who are not willing to earn the diploma that should alone be the guaranty of their ability to perform the work they profess to do. The time has passed by when the carpenter can leave his bench, and the blacksmith his anvil, and with a few weeks of instruction in the art of *tooth-pulling*, hang out his sign of dentist in flaring capitals. We, as a profession, require something more; you, who are the supporters of such practitioners, should have a standard of excellence nothing lower. Have the public at large taken this high ground? I regret to have to say no. The graduate of our colleges, who has, at heavy expense of time and money, qualified himself for all the branches of his profession, is met at almost every corner with just such examples, and the thoughtless public will pass him by to patronize the ex-carpenter or blacksmith. I say thoughtlessly, for few, comparatively, have any idea what is required, in knowledge and skill, to treat successfully diseased conditions of the mouth, never taking into consideration the fact that lasting injuries may result from this careless indifference on their part. Are you aware that one-half of the subsequent ill effects that follow operations, and are so glibly ascribed to colds, are the results of ill-considered or badly-performed operations? I do not for a moment imagine that you do, yet such is undoubtedly the case. Now, what is the remedy? We have it here to-night before you. Let public opinion be so positive in its character, that no more will a man dare to treat the mouth, without a fitting education to qualify him, than the same individual would attempt the practice of medicine. You may say quacks abound in that profession. True, but they are exceptional cases, and have an exceptional practice. Do not misunderstand me. I do not wish to include all that go by the name of dentist with this class; many, very many worthy and intelligent practitioners are to-day doing yeoman service in the profession, but they belong to those who have grown up with it almost from its infancy, and are fully conversant with all its requirements. But it is of those who, in this day of enlarged facilities for instruction, will attempt to perform that which can only be acquired by proper training, that I now speak, and I ask, at your hands, for those who have aimed to qualify themselves in the experiences of the past, before commencing that of the future, that they receive adequate support to encourage them in the belief that the stability of a superstructure depends, not on the top stone, but on the base upon which it is reared. It is no argument against the proposition I have laid down, that colleges turn out men unworthy to bear their honors; all this is granted. The seeds of education do not always fall on congenial soil, neither can we hope to mould the human brain, or make the human hands manipulate as we would have them. Individuals, many times, mistake their calling; a poor minister would frequently make a better carpenter, or the carpenter a better lawyer. Their must be a peculiar talent for certain things before education can be of much avail. Some accomplish more in twelve months' earnest application to study than others in twelve years; but this is no argument against proper mental training. The individual who has been twelve years is just so many times better off than in profound ignorance, though he may never become a learned man. But these are truisms, that need no argument with an intelligent audience.

I always feel like rejoicing when men step out of the ordinany walks of life, and aspire to that which requires brain work to advance the aspirant to honor. I do not mean by this that men should undertake that for which they have no peculiar abilities. The world cries aloud, the professions are full, send your sons to the shop! The professions are never full of the stamp of men that truly belong to them. A brain born into the world, qualified for a certain work, will find that work to do. When the professions cease to be objects of interest to the human intellect, that intellect may be said to be in its decadence, if it has not already lapsed into barbarism. The professions lead the civilization of the world; as they advance, the nations advance to higher intellectual attainments. I, therefore, welcome all (who feel they have something to do therein) to the profession to which I belong, and gladly would I welcome still more than the world generally concedes have a right *there* to be.

The recognition of the right of every human being to an equal share in the privileges that we enjoy, has not yet become a principle of faith and practice, as I think it should. We say to one-half of the human family, stitch, stitch, darn stockings, make shoes for a shilling, stand behind counters for two or three dollars per week, do anything, but don't enter the sacred precincts that we have marked out for our peculiar benefit. Every human soul has certain qualities; those qualities should mark its pathway through life. Talent is of no sex, color or clime, but is an inheritance from the Creator, given to be fully cultivated in the direction that it leads; hence, in my judgment, any attempt to cripple the aspiration of a God-implanted intelligence is unworthy the age in which we live, and is little short of blasphemy against the Creator himself. As we keep any number of the human race in a condition lower than ourselves, just in that proportion will the degradation be a mill-stone around our necks: the reverse of the proposition is also true. As we advance the masses in intelligence, and the means of acquiring information and pecuniary rewards for labor, will the civilization of all be increased. Hence, as an individual, I welcome all classes to the profession of which I am a member, and should make but *one* requirement—do you feel that you are *qualified for it*, and would do better in it than in any other position in life? Entertaining these views, I rejoice that dentistry has, though the youngest of the professions, welcomed woman, in two of our State organizations, to full membership, and have recognized her as a co-laborer in a field full of interest, and one in which, to my judgment, she is well adapted. It may be that I stand alone in these views, both with the Faculty of this College and the audience; but I trust not, as, in my judgment, the advancement of the world depends, to a large extent, upon their adoption. But the number who are willing to sustain them is of small moment; the question to be considered is, *are they true?* Has not every parent, who fails to give his or her daughter a knowledge of some trade or profession, neglected one of the plainest requirements of life? Certainly. The world is full of misery on that account. I am sick of that cant and hypocrisy that would prevent woman doing anything to earn her daily bread, and calls it a dispensation of Providence when that woman is left with a family of children to support, by toiling her days and nights away over the needle. Let your daughter enter the professions, or anything she can earn a livelihood at, and regard it as a dispensation of Providence that He has, in His wisdom, given that daughter brains enough to take a position in life higher than you may have ever been able to fill. The world is very slowly coming to an appreciation of this great truth; but it will grow, and become the belief of the nations in time, not in yours and mine, perhaps, but it will come; for "the mills of the gods grind slow, but they grind sure."

The profession of dentistry has been slow to receive that appreciation at the hands of the public that it deserves. Few realize how much they are indebted to the intelligent practitioner for the healthful action of all the functions of life. Still fewer realize the fact that many of the diseases that puzzle the physician, and destroy the patient's happiness, have for their basis diseased teeth. The ignorance on this subject is lamentable, and the effects are disastrous, not only on you, but on future generations.

We, Americans, have the unenviable reputation of having the poorest teeth of all the nations of the world. We cannot attribute this solely to climatic influence. Is it not to be supposed that those who emigrated to these shores in the early history of this country, had quite as good teeth as the nations of Europe have at the present? What may we infer to be cause of the degeneracy? The early settler was not only exposed to the miasmatic influence of all newly settled countries, but the necessities of toil engendered carelessness in those niceties of life, regarded by modern civilization as so important. The teeth are always the first to be neglected. Some you are aware will be very particular to wash the face, and are over nice as to the cut of the collar, but ignore the tooth brush entirely, under the supposition, doubtless, that nature having supplied the teeth it is her business to take care of them. So our forefathers, doubtless, thought, and carelessness engendered disease—disease, combined with an undue amount of physical toil, produces misshapen and imperfect formations. The peculiarities of the parents were handed down from generation to generation, each in its turn adding to the trouble, until it will take a long period of time to overcome the evil. But are we not overcoming it? Most assuredly we are. Look around you even now, and judge if the teeth of this generation are not better than those of our fathers and mothers at the same period of life. With the present attainments in dental knowledge, there is no reason why any of you should ever need an artificial substitute, and, in a properly instructed community, the labors of the mechanical dentist must in time be confined to a very narrow field. But are you instructed? I answer, *no*, and the dental profession are much to blame for this state of things. The old adage "that a little knowledge is a dangerous thing," is an absurdity and has been productive of much mischief. It is unnecessary to suppose that you, as parents, need ever become doctors or dentists to have a sufficient modicum of knowledge to enable you to discern intelligently many of the diseased conditions that you meet with in your children. How many little ones to-day might be making glad the home fireside, if you, fathers and mothers, knew more about dentition than you do. The little mounds that rise over their bodies, everywhere by thousands, are in many cases, (how many who can tell?) the result of gross ignorance on the part of the parents. You say we depend on our physician. Is the physician ubiquitous? He cannot do everything. The little sufferer is teething. You see it suffering, and know nothing of the cause. It is your business to know. You have undertaken the care of a helpless human soul, encased in a body liable to all the ills of humanity; it is your place to be able to alleviate some of those ills. You should know the period of the eruption of your child's teeth, and you should also know how to use the lance judiciously. I am aware that with this knowledge, some professional gentlemen would have smaller bills to send in yearly; but what is that, when weighed in the balance with human suffering? If the spreading of intelligence amongst the masses goes to destroy any cherished profession or means of livelihood, the sooner that is accomplished the better. But has it that effect? Not at all. The dentist is best appreciated in communities that possess the largest amount of general intelligence, and, in proportion as you go down in the scale, is he contemned and his services ridiculed. How much do you, who have passed the meridian and are descending the pathway of life, owe to dental skill? Our fathers look dignified in their old age with mouth in full proportion, and our mothers are comely behind their artificial sets. But looks are secondary. The man and woman of seventy enjoy their food, and prepare it as well for the digestive organs as the youth of twenty. Health is thereby preserved, and, encased in vigorous bodies, we generally find vigorous minds. I have no doubt that the liability to lapse into semi-idiocy as age advances will, to a large extent, be prevented by this alone. I do not repeat these things to make a special plea for my profession; but rather to urge you to higher attainments in the knowledge that I conceive so essential to happiness. An education should be considered incomplete, either to man or woman, that had not embraced at least a partial course in one of the medical or dental schools. Give your daughters less French and music, and more science; and have your sons to believe there is a higher remuneration in the study of the great laws that govern the universe, than in dancing attendance at balls and theatres upon every young miss who values his attentions in proportion to the amount of cash spent.

Gentlemen of the graduating class, you have finished your course, you have won the crown. What now shall be your future? This must be marked out by yourselves. The broad paths of a world lie open before you, the book of your lives still lies sealed. It is for you alone to unband the clasp and begin the lesson. It is one full of interest, full of grand work, full of cherished hopes, full, perhaps, of promises redeemed, and alas it may be full of withered hopes, full of clouded days and saddened nights. But, we cherish the beautiful in life. Mourning and sorrow may haunt us all our life long; but the sunshine of the heart lingers at the threshold of every dwelling; and, in proportion as we throw open the closed doors, the streaming rays enter therein. Yes, cherish the beautiful. It will build you up in your profession, it will make the labor of relieving poor humanity an artistic inspiration. It will make you strong along many a weary mile of life's travel, and gladden, perhaps, the soul in its outlook on eternity at the close.

Lives are not the creation of a day. They are not born, they are the experiences that men feel, in other words, the power that these experiences give to make the world heed their individual presence. The man who goes through this world and is satisfied with the crumbs that fall from other men's tables, is not living, it is *death* in life. He is a walking corpse, hanging a millstone about the necks of other aspiring intellects. Life is then an active, earnest, unswerving determination to build higher than other men; a great effort to leave behind us "footprints on the sands of time," that have character, and can be read with instruction by other minds. Mere vegetative existence is not the point for the human soul to aspire to. Then, ere you take the first step onward, stop to consider. You are now in the position of the man at the base of the mountain. He feels not intimidated at the difficulties. He is to reach the top; if so, he must clamber rocks, scale precipices, toil long and wearily; but the end justifies the outlay of labor. So with you, make up your minds to meet the contest, for a professional life is a contest of no mean proportions, meet it with brave hearts. The instructions you have received in the several departments of this institution are full, but they are the mere corner stone to your building. If you, as master-builder, go no higher, the foundation will in time crumble away, and men will point to you as an evidence of wasted energy; but, if you quietly labor on, the corner-stone ceases to be the prominent object, and the world looks to the super-structure that is being reared and honors the architect.

From this hour you pass from under the care of your teachers, and go forth to gather from general sources of knowledge and experience, relying upon your own mental strength. In doing thus, you will necessarily need a wise discrimination, an earnest application, and a determination to follow results to causes. This may not always be attainable; but the effort to accomplish this is education, and the training it gives is what we need for growth.

In this struggle to solve the mysteries of knowledge, neither you nor I may ever attain originality; but we must go through the same experiences of thought that original minds have had to, to solve the problems of science, if we would ever hope to arrive at their level. By this process we qualify ourselves for original investigation; and in so doing, we are not mere slaves to other men's opinions, but, taking them for guides, we pass through the labyrinth of intellectual labor, and eventually come forth to the clear conception of things for ourselves. In other words, we renew our individuality.

In this position you are to-night. To the best of our ability, we have carried you step by step to this hour, and here we leave you; and it depends upon yourselves, whether progress ceases from this moment or whether you go on doing honor to yourselves, by adding to the sum of human knowledge and intelligence; or whether you lay aside all earnest study and give yourselves up to the more selfish business of making money. If this is your object, ignore mental labor or any effort to bring out new ideas, or to improve those already held. Original men rarely get rich. The poverty of inventors, the benefactors of the age, has passed into a proverb, and why is this? Because they devote their lives to an idea, regardless of anything but its fullest development. Having accomplished this successfully, their work is done. To bring to perfection an original thought, is the ever present inspiration, an inspiration too high to descend to the mere chaffering over dollars and cents. It must be through the accidents of life, if you find your truly original man a rich one.

Therefore, select, at the opening of your career, which ye will serve, the accumulation of wealth or the cultivation of the highest intelligence commensurate with your abilities. I have no special advice to give, and perhaps it would not be heeded were it given, but each must follow his own promptings in this matter. The world is doubtless well-constituted, that some are to do the thinking and another class to outwork the brain-labor of other men.

Perseverance in carrying forward your professional duties is equally as important to you as any of the questions named. A want of courage to meet the many obstacles that will be thrown in the way of success, is the cause of many, very many failures, not only in our profession, but in all occupations of life. It is an old but true saying, that the wheel of every man's life is ever turning, and however low down he may be to-day, the time must come when the revolution carries him up higher and higher still. You need not expect the world to take you by the hand at the outset of life—the world rarely ever does so kind an act—but, in proportion as you give evidence of ability to deserve that appreciation, you will find some few to comprehend it; and as small springs become rivulets, and and rivulets rivers, and rivers oceans, so you will, by regular gradations, move onward in the progressive march to independence. Therefore faint not, nor grow weary with waiting at the slow appreciation the world gives you. Eat your brown bread, if needs be, in patience. Learn to labor and to wait.

There is something grand in a struggling soul, with an instinctive aspiration for the unattained, groping in darkness, poverty and neglect, and, as we read these experiences in the lives of great minds, we feel to glory in our race. It is a severe training school, yet it braces the mental nerves, and makes our intellectual muscles grow strong and powerful for the after-work of life.

Let true success be based on ability and a high moral standard. The character of professional men is more open to criticism than those of other occupations; and this is especially true of the doctor and dentist. The world has a right to judge of your moral character, and should so judge before you are taken by the hand. You have to deal, during your professional life, with all characters, sexes and conditions. So demean yourselves that the humblest of your patients may never be able to cast a stain on your character, or do other than remember you as the true gentleman in every respect. Coarseness of manners, or untidyness in personal appearance, or a want of an enlarged sympathy with human suffering, are unbearable in the dental operator. Treat the little sufferer, that may come under your care, with the gentleness of a father, remembering ever that these little blossoms become the full grown flower, to bless you in after years for your care and kindness in its young life. Bear with the idiosyncracies of patients, as you hope to be borne with when the heavy hand of disease holds you in its iron embrace. Possess your souls in patience, for you will need, through every hour of your professional career, all you can summon to your aid; in a word, be true to your highest conceptions of duty, and you will grow physically, mentally and sympathetically, and ultimately reap the full reward of all your deservings.

I have spoken to you as though *all* were at the commencement of life. I am aware this is not so. All honor to those who have left professional duties to qualify themselves to perform more intelligently the duties of the dentist. There has been nothing, in all this course, more encouraging than to have those in this class willing to listen and receive instruction at the hands of younger men. With middle life, so full of aspiration for a higher cultivation, may we not expect that the declining years will be rendered beautiful by accumulated wisdom, and the snows of many winters melt before the warm life of mental activity.

In this hour of triumph, two of your number are lying on beds of sickness, far from friends and home. Though the evening is full of hopes realized, and bright anticipations, it is dimmed by the cloud of their absence; the vacancy is sensibly felt. We would send to them an expression of our deep sympathy, and trust that the dark shadow, that lingers around the young life of one of these, may pass away, and that there may still be a future for him in this beautiful world.

Gentlemen, the work of the hour is done—the hand is already pointing to the moment when you snap the cord that has bound us together, and hasten onward to the several homes that lie on so many divergent paths.

Those who have watched and waited, through all your lives long, are anxiously looking for the reunion, so soon, I trust, to take place. This hour is yours and theirs; yours in hope, theirs in anticipation. You go forth from this busy hum of life, I trust, better men than when you entered; with enlarged and grander views of life; with determination to live and be more than you have ever been. Each of you will move in a circle of active duty; a circle that must ever widen in proportion to your faithful work.

In far distant sections of our country you may find your future homes. Wherever you may go, whether to the North, South, East or West of our *own* land, or to the regions glorious with the luxuriance of tropical life, you may rest assured that you carry with you the anxious fears and earnest hopes of your teachers. We will rejoice in your successes, sympathize in your disappointments, and will ask you in return to aid us, by all the powers of cultivated intellects, in solving the problems that yet darken our professional pathway. You go, we remain, to toil on for the benefit of other minds; and though it may be that the clods of the valley cover some of us, and we see each other no more in this life, yet the work that has been accomplished *can never be lost.* The small seed will become the full waving field of grain, and the harvest will be gathered, whatever may become of you and I. The welcome home—the glad song of rejoicing already sounds in your ear—the satisfaction of loved ones, at battle fought and victory won, awaits you, and with them and you, I, too, rejoice, and trust that the choral note of happiness may ever have as true a foundation. We bid you farewell, and may the rugged and the smooth places of life each have their lessons of wisdom, and may the blessings of the truly good follow you for ever and for ever.

Thus ended this instructive and interesting occasion. It is one always replete with the best feelings of our nature and kindly wishes for the success of the young graduate, from teachers and audience, and the regrets of all that the intercourse of months must have so sudden a termination; but the genius of our American life, hurried and active, allows no time for vain regrets. Onward, to the great work of life, each one must address himself, meet its difficulties and its successes with equanimity, and in years be able to revert in memory to the session of 1865–'66 as an occasion full of pleasant reminiscences.

We are under special obligations to Dr. Norman W. Kingsley, of New York, for a valuable contribution to the museum of the College, viz: the plaster casts, metallic dies and appliances, showing Dr. Kingsley's method of treating cleft palate by the application of a substitute; also to Drs. Hape and Nelson for valuable specimens of necrosis of inferior maxilla.
G. T. B.

BALTIMORE COLLEGE OF DENTAL SURGERY.

The twenty-sixth annual commencement of this College took place on Friday evening, March 2d, at the New Assembly Rooms. The hall was filled to its utmost capacity, and the excellent music of the Blues' band tended in a great measure to enliven the scene. The exercises commenced with prayer by the Rev. Dr. Roberts. The degree of Doctor of Dental Surgery was conferred upon the following gentlemen, composing the graduating class, by Prof. F. J. S. Gorgas, Dean of the Faculty: Chas. Porter Baird, Tennessee; Andrew Benjamin Brookins, Florida; Stanley Brown, Texas; John Thompson Coumbe, District of Columbia; Albert Philip Gore, Maryland; William Albert Jones, Virginia; Robert Paine Nevill, Alabama; Thomas Nash Read, Virginia; Charles Henry Thayer, Rhode Island; C. Watson Westmoreland, Alabama.

The valedictory address was delivered by Prof. Thomas E. Bond. Several changes having occurred in the Faculty since the last annual commencement, the following is a correct list of the officers of the Baltimore College of Dental Surgery:

Thomas E. Bond, M. D., Professor of Pathology and Therapeutics; Philip H. Austen, M. D., D. D. S., Professor of Dental Science and Mechanism; Ferdinand J. S. Gorgas, M. D., D. D. S., Professor of Dental Surgery; A. Snowden Piggot, M. D., Professor of Chemistry; Russell Murdoch, M. D., Professor of Anatomy; Henry Reginald Noel, M. D., Professor of Physiology; Henry Hobart Keech, D. D. S., Demonstrator of Operative Dentistry; Thomas Sollers Waters, D. D. S., Demonstrator of Mechanical Dentistry; Claude Baxley, M. D., Demonstrator of Anatomy; F. J. S. Gorgas, M. D., Dean of the Faculty.

THE NEW YORK COLLEGE OF DENTISTRY.

About a year ago the Legislature of this State granted a charter for the incorporation of a Dental College in this city, and appointed some nine gentlemen of the city, including several well-down dentists and medical men, incorporators of that institution. Up to this time, however, owing to several causes, no definite action has been taken by the corporators toward the fulfillment of this design. Last evening a meeting of the dentists of this city and vicinity was held at the house of Dr. George E. Hawes, No. 21 Bond street, to consider what action it would be expedient to take in reference, to carrying out the provisions of this act. Nearly all the leading dentists of New York, and some from adjoining cities, were present. A spirited discussion was held on the merits of the proposed institution, participated in by such members of the profession as Dr. Dwinell, Dr. Main, Dr. Lord, Dr. Parmly, Dr. Hawes, Dr. Dodge, Dr. E. J. Dunning, Dr. J. H. Foster, Prof. R. K. Brown, M. D., F. D. Weiss, M. D., and others. The unanimous opinion of those present seemed to be, that some institution which should impart a thorough scientific and practical knowledge of the art of dentistry was imperitavely needed in this city. The only differences of opinion were in regard to some of the details of its management. After considerable discussion, a committee, appointed for the purpose, presented a preamble and resolution, which were adopted by acclamation.

Editorial.

INSTRUCTIONS IN THE MANIPULATION OF HARD RUBBER OR VULCANITE FOR DENTAL PURPOSES. BY PROF. E. WILDMAN. This is a small work, published by S. S. White, giving a general outline of the process of making rubber work. It is a clear and concise explanation of the manner of working rubber from making the models to finishing the piece. Mounting full sets, partial sets, with or without clasps, attaching teeth to a gold or platina plate, refitting gold plates with rubber, and the mode of refitting vulcanite sets is described so plainly that any person who can mount teeth on metal will find no difficulty in understanding this process. And although the work was written more for those who have had little or no experience in working rubber still the most proficient will find much in it that is new and useful. So rapid has been the sales that it is now in the third edition. We confidently recommend this as one of the most useful works for dentists that has ever been published.

T. L. B.

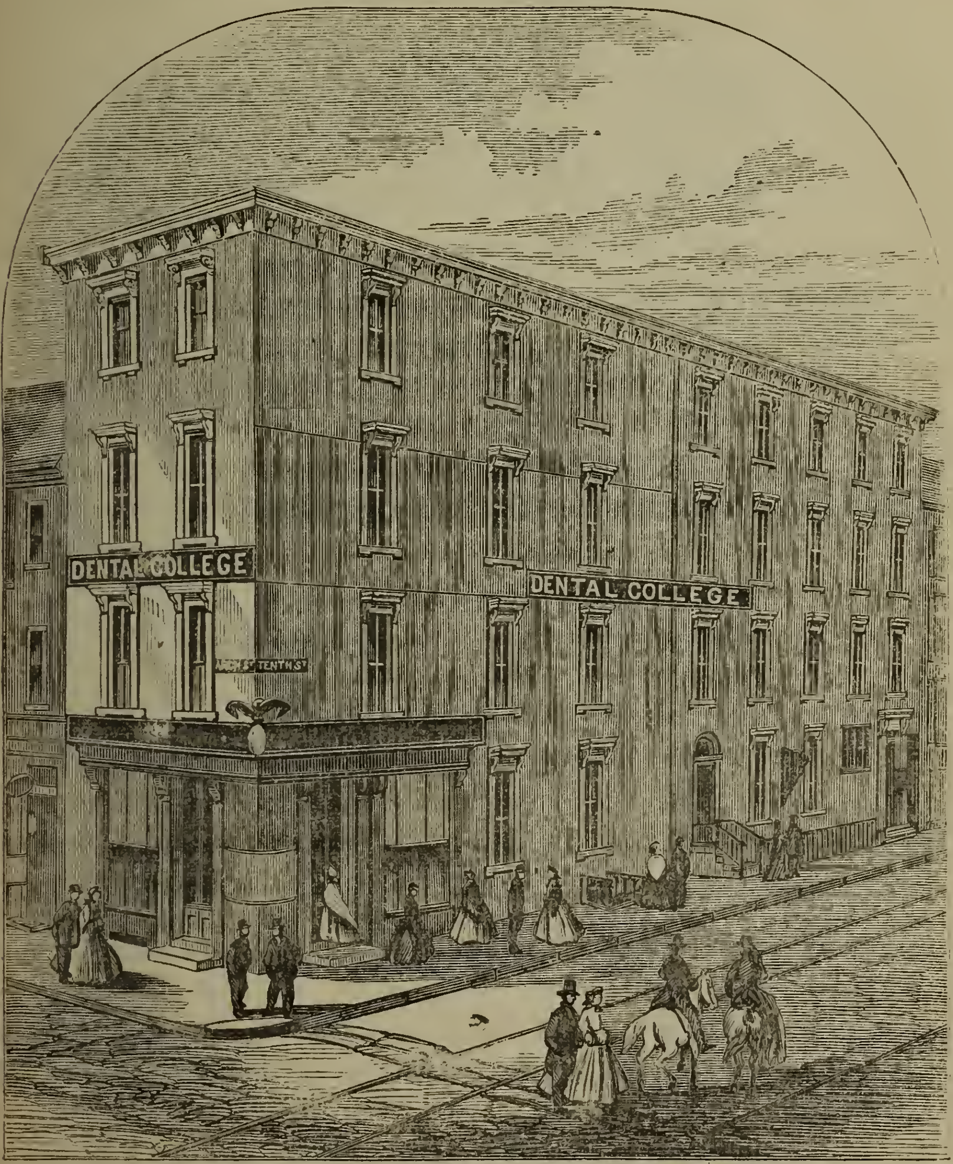
A NEW VULCANIZER.—Dr. George E. Hayes has originated several patterns of vulcanizers, all of which display much taste and skill; he now offers a new one which he styles "The Iron Clad," which it is in reality: it consists of a copper boiler one-sixteenth of an inch in thickness, encased in a malleable iron shell an eighth of an inch thick. This iron clad is designed to act on a principle directly the reverse of the larger class, by shielding those around it from harm, instead of scattering death and destruction. We are glad that dentists have been sufficiently awakened to the danger of using such frail shells as are usually made, as to make it necessary for at least one manufacturer to consult his and their mutual interests. Dr. Hays has taken a step in the right direction. E. W.

DRS. SNOW AND LEWIS, of Buffalo, New York, have invented an automatic plugger which, for simplicity and effectiveness, exceeds any instrument of the kind we have ever seen. It is very simple in construction, and all the works are enclosed in the handle, so that, in appearance, it resembles very much an ordinary large sized plugger. It strikes with four degrees of force; the lightest can be used on almost any tooth, be it ever so frail, while the heaviest is as hard as is ever required. We have been using one of the instruments for some time past, and find it equal to the mallet, in some cases we prefer it, as it can be used where it is almost impossible to use the mallet. T. L. B.

CAOUTCHOUC.—The article upon this subject would have been continued in this number of the TIMES, but from the misfortune of the manuscript having been lost on route to the printer, and was not recovered until too late for insertion. E. W.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE ELVENTH ANNUAL SESSION, 1866-'67.



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DEMONSTRATOR OF MECHANICAL DENTISTRY.

The Lectures to the Regular Course commence on the 1st of November and continue until the 1st of March.

During the last two weeks of October, preliminary Lectures are delivered, one each day.

The Rooms for Operative and Mechanical Dentistry are open from the 1st of October and throughout the session, under the supervision of the Demonstrators.

The Dissecting Room, under the superintendence of the Professor of Anatomy and Physiology, is open during the session.

Fees for the Course, (Demonstrators' Ticket included,)	**$100**
Matriculation, (paid but once,)	**5**
Diploma Fee,	**30**

T. L. BUCKINGHAM, Dean,

C. P. REESS, Janitor. **243 North Ninth St., Philadelphia.**

P. S.—Board may be had at from $3.50 to $6.00 per week.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The Eleventh Annual Session, 1866-'67.

The eleventh annual session of the Pennsylvania College of Dental Surgery will commence on the first of November, and continue until the first of March. Preliminary lectures will, however, be delivered each day during the latter half of the month of October. The Dispensary and Laboratory of the College will also be open from that time, where ample opportunities will be afforded for the prosecution of the practical part of the profession under the daily supervision of the Demonstrators, who are gentlemen of known integrity and thorough capability. During October, as well as the entire session, a clinical lecture will be delivered, and operations performed by one of the Professors every Saturday afternoon.

The course is so arranged that fifteen lectures are delivered each week, on the various branches taught in the school. A synopsis of the manner in which each department is treated will be found under the head of the different chairs.

These lectures occupy about the average time of three hours each day. In addition, four hours are daily spent by the student in actual practice. With this object in view, the operating rooms are furnished with twenty chairs, so arranged as to command the best light, and all the appliances necessary for comfort and use. To these chairs the students are assigned in classes, and certain hours are fixed for each member of the class to operate.

Each student is required to provide his own instruments, (except those for extracting,) and to operate with them. He is expected to keep them in perfect order, and for that purpose is provided with a table in which they can be locked up when not in use. As the operations performed at the College are entirely gratuitous, a superabundance of patients invariably present themselves.

In the mechanical department every process known in the profession, which has any value to the mechanical dentist, is fully taught; and receipts of valuable compounds are freely imparted. All the conveniences are at hand in the Laboratory for the preparation of metals, manufacture of teeth, (single and in blocks,) mounting, etc.; and the student is required to go through all the necessary manipulations connected with the insertion of artificial teeth—from taking the impression to the thorough construction of the denture, and proper adjustment of it in the mouth or the patient.

In addition to the facilities afforded by the College for a thorough course of instruction in the theory and practice of Dentistry, the celebrated hospitals and clinics of the city constantly enable the student to witness various important surgical operations which are highly interesting and instructive. The medical and surgical clinics of the Blockley Hospital, in particular, one of the largest eleemosynary establishments in the world, are open to Medical and Dental students, free of charge. The staff of this institution is composed of some of the most eminent physicians and surgeons of Philadelphia.

COURSE OF LECTURES.

CHEMISTRY AND METALLURGY.

The course of instruction from this chair will commence with the consideration of the imponderable substances.

The laws that govern the imponderable bodies will next claim attention, with some notice of symbols or chemical notations. Individual elements, and the compounds resulting from their combinations, will then be considered. Organic chemistry will receive its full share of attention.

The course will be illustrated by diagrams and such experiments as can be performed before the class.

DENTAL PHYSIOLOGY AND OPERATIVE DENTISTRY.

The lectures in this department will embrace the Physiological Anatomy of the teeth, general and microscopical, in addition to a minute and careful description of the various operations performed by the dental practitioner.

The microscope, models and diagrams, will be employed in illustration. At the Clinic the incumbent of this chair will also demonstrate before the class the various operations described in his course of lectures.

MECHANICAL DENTISTRY.

The instruction from this chair will embrace the entire range of manipulations legitimately connected with the laboratory, arranged in two divisions—Mechanical Dentistry proper, and that to which has been applied the appellation of the Plastic department.

I. *Mechanical dentistry proper* will include everything appertaining to the construction of dental substitutes, passing through the different stages of preparation, from taking the impression, to the completion and proper adjustment of the case in the mouth, conjointly with features, expression of countenance, enunciation, etc. It will likewise embrace the metallurgic treatment of the various metals employed, the preparation of plate and wire, the alloying of gold, together with the *alloys* used, as well as those designated as solders.

II. This division will comprise all that appropriately belongs to the manufacture of porcelain or mineral teeth—single teeth, block-work, continuous gum-work, .vulcanite, etc. The materials, their preparation, compounds and uses, will be specially regarded.

All new inventions, modifications, and improvements, in this branch of the art, will in place receive due attention and investigation.

PRINCIPLES OF DENTAL SURGERY AND THERAPEUTICS.

The lectures delivered from this chair will embrace General Pathology, Dental Pathology, the Pathological Relations of the Teeth to other parts of the System, together with a minute description of all special diseases that have any relation to Dental Surgery, or of interest to the Dentist.

They will also include a careful examination of therapeutic agents and their general application. Their indications in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated, and also the general hygienic rules and principles which come within the province of the practitioner.

ANATOMY AND PHYSIOLOGY.

The instruction in this department will embrace a plain and comprehensive view of the structure and functions of the Human Economy. The valuable anatomical preparations of the incumbent of this chair, (consisting of Papier Mache manikins, models in wood, drawings, wet and dry preparations,) will enable him to fully illustrate his course. With the same object, vivisections on the lower animals will also be employed.

The special relations of this branch to the wants of the dentist will be kept steadily in view, and such descriptions of the natural history, microscopical structure, connections, &c., of the teeth, as their importance demands, will be given.

The great facilities for the study of practical anatomy, to be found in the city of Philadelphia, obviate the necessity of providing a dissecting

room in the College. For the usual fee of $10, the student can have access to one of several well-ordered and well-supplied dissecting-rooms.

QUALIFICATIONS FOR GRADUATION.

The candidate must be twenty-one years of age. He must have studied under a private preceptor at least two years, including his course of instruction at the College. Attendance on two full courses of lectures in this institution will be required, but satisfactory evidence of having attended one full course of lectures in any respectable dental or medical school, will be considered equivalent to the first course of lectures in this College; five years' practice, inclusive of the term of pupilage, will also be considered equivalent to the first course of lectures. If the candidate has been in continued practice since 1852, he is eligible for graduation without attendance on lectures. The candidate for graduation must prepare a thesis upon some subject connected with the theory or pr ctice of dentistry. He must treat thoroughly some patient requiring all the usual dental operations, and bring such patient before the Professor of Operative Dentistry. He must, also, take up at least one artificial case, and after it is completed, bring his patient before the Professor of Mechanical Dentistry. He must, also, prepare a specimen case to be deposited in the College collection. The operations must be performed, and the work in the artificial cases done, at the College building. He must also undergo an examination by the Faculty, when, if found qualified, he shall be recommended to the Board of Trustees; and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

TEXT BOOKS AND WORKS OF REFERENCE.

Wilson's, or Leidy's Sharpey & Quains' Anatomy; Carpenter's Physiology, or Dunglison's Human Physiology; United States Dispensatory; Mitchell's Materia Medica; Fownes' Elements of Chemistry; Regnault's Chemistry; Lehmann's Pysiological Chemistry; C. J. B. Williams' Principles of Medicine; Wood's Practice; Tomes' Dental Physiology and Surgery; Harris' Principles and Practice; Taft's Operative Dentistry; Richardson's Mechanical Dentistry; Paget's Surgical Pathology, or other standard works on the subject.

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